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Railway Age Gazette

Volume 60

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No. 8

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GENERAL NEWS SECTION

*Illustrated.

After eight months of electrical operation the capacity of the 30-mile line of the Norfolk & Western in the West Virginia coal fields has been practically doubled; the average speed of trains has been increased from six miles per hour with steam locomotive operation to 14 miles by electric operation; 12 electric locomotives have replaced 33 Mallets, and of these 12, 9 only are usually in service operating 22 hours a day, and the entire terminal and shopping facilities for the electric locomotives consist of one inspection and machine shop for general overhauling and one outdoor pit, a small frame office building and a few sandboxes for terminal inspection repairs. The necessity for the former rather extensive roundhouses, coal and water stations, cinder pits, turntables and repair shops has been eliminated. The results of operation of this electrified steam line are described at some length elsewhere in this issue. These results have been in general very satisfactory. In particular the electric braking of heavy tonnage trains has proved very efficient and the practicability and durability of the light, flexible overhead type of catenary construction for supplying power to high power locomotives has been demonstrated.

The Senate has passed the bill for an investigation of railway regulation by a joint committee of Congress. As announced last week, this resolution, in the form in which it goes to the House, includes an amendment, introduced by Senator Borah of Idaho, providing that there shall be included an inquiry into the desirability of government ownership. As Senator Newlands pointed out, the countries in which the principal experiments with government ownership have been made are now at war; and, therefore, study on the ground of their systems of management and the results attained would be impracticable. But, under any conditions the railways of the United States need feel no apprehension regarding the ultimate results of any fair inquiry into the subject. Even under more favorable conditions, the investigators would have to rely largely on the data afforded by official reports; and the more such data are studied, and the more publicity there

is given to them, the less danger there will be of the adoption of government ownership in this country. It seems not improbable, indeed, that the nation must be educated to a point where it will deliberately and definitely decide to avoid government ownership before it will adopt a sound, fair and constructive policy of regulation. The strongest objection to Senator Borah's amendment is that an investigation of government ownership is a larger and more difficult undertaking than an investigation of regulation; and that if the committee should enter on the former first, the conclusion of the latter, with any resulting improvements to which it might lead, would be long postponed.

Officers of the brotherhoods of train service employees who are seeking a wage increase of \$100,000,000 a year, under the pretense that they are asking simply a reduction of hours, are trying to bolster up their case by using the reports of the Interstate Commerce Commission division of safety showing the number of instances in which employees worked beyond 16 hours. As the railroads have made a remarkable improvement in this respect in the past two years, the brotherhood leaders evidently do not consider that the showing made in 1915 is sufficiently bad for their purpose, and they are using old figures. Just how reliable is the sort of information they are giving to the public may be judged from the fact that at a meeting held in New York on February 13 a telegram was read from A. B. Garretson, president of the Order of Railway Conductors, in which he said: "The Interstate Commerce Commission's statistics show for year ended June 30, 261,332 cases where 16 hours service were exceeded by train and enginemen." These figures are for 1913, not 1915. The year was left blank in the telegram as it was published in the newspapers. The 1915 report of the commission shows that the number of instances in which train service employees continued on duty for longer than 16 consecutive hours had been reduced to 59,915 for that year. In 1914 the total was 131,881. Not satisfied with using a figure over four times as great as that for 1915, Mr. Garretson multiplied it by five, saying that each case involves five men. This was for the purpose of implying that each instance referred to a train

Hours of Service of Train Employees

and crew, whereas the commission's report distinctly refers to employees, not trains. His total is therefore 20 times as large as it should be. The total number of train service employees for 1915 is not yet available. On June 30, 1914, however, it was 311,990 for all the roads in the United States. Of this total, 59,915 were required for one cause or another to remain on duty—not necessarily to work—once each for more than 16 consecutive hours in the year. On the basis of the 1914 figures less than one-fifth of the men, for one day in the year, had to remain on duty for more than 16 hours. The average man on this basis would work 5.2 years for each time he would be required to be on duty longer than 16 hours. According to the commission's report 31,886 of the cases reported were due to collisions, derailments, track defects or landslides, and because they were the result of unforeseen occurrences, were not unlawful. The remainder, 28,029, also includes many cases which were probably not unlawful. The 28,000 men therefore stood a chance of working at least 11.2 years without being required to work excess hours in violation of the law. A total of 252,075 men worked through the year without even being required to work more than 16 consecutive hours and 283,961 were not required to do so, except as the result of a collision, derailment, track defect or a landslide. The brotherhoods are now seeking to have the hours of service law amended to increase the penalty for violations but the man who has to work over 16 hours once in five years hardly has a case that demands national legislation.

WASTING A MILLION WORDS A DAY

THE proceedings recently had before the Senate committee which is investigating the judicial temperament of Louis D. Brandeis must have been viewed by railroad men with mixed feelings of bewilderment and amusement. Heretofore their opinions of the brilliant Boston opportunist, who is now a candidate for the Supreme Court, have not only lacked somewhat of unanimity, but have been subjected to several changes without notice. But since the attack on him by Clifford Thorne, who evidently wants a monopoly of the job of "friend of the people," railroad men have undoubtedly felt a bond of sympathy with Mr. Brandeis.

Most railroad men still think of Mr. Brandeis as the man who told them they were wasting a million dollars a day, and who has ever since been given credit in the public prints for most of the economies effected by the railroads, from those brought about by the progressive increase in train loading, which has been going on for 20 years, to the reductions in expenses in the past two years accomplished by laying off men and taking off trains. Other railway men think of him as the man who in a freight rate case declared that passenger rates ought to be raised. It was in this case that he was guilty of the unethical conduct of disagreeing with Mr. Thorne, while agreeing with nearly everybody else, in saying that the railroads needed more money. This caused a reversal of some railway men's opinions of him; but when by proposing various substitutes for an advance in rates he very effectively prevented the roads from getting more than half of what they had asked, enthusiasm for him rapidly waned.

In most of the experiences of the railroads at the hands of these two gentlemen their relations to them have been highly unsatisfactory. But when Thorne accuses Brandeis of having betrayed the people to the railroads, the roads, in spite of the latter's slight delay in delivering the goods, ought to be able to extract at least a smile from their role of innocent by-stander.

In the case referred to Mr. Brandeis was acting as special counsel for the Interstate Commerce Commission, the tribunal before which the case was being tried. The railroads were represented by their counsel and the shippers by their counsel, including Mr. Thorne, who is incidentally chairman of the Iowa Railroad Commission, but who, in his capacity of

amicus curiae extraordinary, declines to be limited in the range of his clients. Naturally, the profound, fair-minded and immaculate Mr. Thorne was dumfounded that Mr. Brandeis should not have accepted his theories and acted with him as a violent partisan of the shippers.

The affair becomes still more puzzling when we read that J. Ogden Armour has advocated Mr. Brandeis' confirmation. There has not heretofore been an entire lack of harmony in the relations between Mr. Thorne and the meat packers, who, in fact, are understood to have contributed largely toward his expenses in the recent rate cases. It may be that, in referring to Mr. Brandeis, Mr. Armour spoke as a railroad director rather than as a shipper.

If Mr. Brandeis in some way could be induced to express his opinion of Mr. Thorne he could make a friend for life of every railroad man in the United States. Such a subject would afford a wide field for his talents. He should at least be able to show the Iowa friend of the people where the latter could save a million words a day.

THE POSSIBILITIES FOR THE BOSTON & MAINE'S FUTURE

IF the leased lines of the Boston & Maine, in holding out for the same returns under reorganization which they are now getting, are asking more than the reorganized company is going to be able to pay, their policy is shortsighted in the extreme, and the acquiescence in these demands by the board of directors of the Boston & Maine is a mistake. The only important concession which the leased lines have made is to convert their fixed charges on the earnings of the system into a contingent charge during the next three years; after that this charge again becomes fixed. If, on the other hand, the system, under good management and settled conditions, is going to be able to earn its interest charges and rentals on the leased lines, and in time also some return to the common stockholders of the Boston & Maine, the leased lines, while exacting in their demands, cannot be said to be asking more than they can probably get, and the Boston & Maine directors are recognizing expediency in granting these demands.

The vote of the board of directors recommending that the leased lines be permitted to come into the reorganization of the system on terms which will give them the same rate of return on their stock which they are now receiving, contingent, however, for three years on its being earned by the Boston & Maine, together with the dissenting opinion by Judge Knowlton, were published in the *Railway Age Gazette* last week. In theory Judge Knowlton is right. The leased lines, if they were to be operated separately—there are 28 of them—would soon become comparatively unprofitable, as independent properties, even while as part of the Boston & Maine system, they could be operated very profitably. Under these circumstances they ought to be willing to make some concessions; but it would be a losing game for the Boston & Maine, as well as for the leased lines, if the system were to become disrupted through receivership. Since the Boston & Maine stockholders are asked to make some sacrifices—although these sacrifices are small compared with that which stockholders of some big roads now in the hands of receivers are called upon to make—the leased lines also ought to be willing to make some sacrifice; but this they will not do. The Boston & Maine stockholders may be morally certain that in the end the leased lines would suffer from a disruption of the system; but if they are also fairly sure that the system kept intact, can in time earn a profit for everybody, they are eminently wise in accepting the demands of the leased lines. In a situation such as this an ounce of practicality is worth many pounds of theory; and the question as to whether the Boston & Maine can be made profitable, while compelled to continue to pay the leased line rentals, is eminently a practical question.

For nearly ten years the Boston & Maine has been in a shifting state of uncertainty. Under the last few years of President Tuttle's administration there was a contest going on for control of the company which, to say the least, was not conducive to well organized and efficient operation. After the New York, New Haven & Hartford had gained control no fixed policy was adopted. One man after another was tried out on the property, but there was permanency nowhere. Maintenance has not been neglected, but improvements and betterments have been woefully lacking.

Viewed as a retrospect of the past, this is deplorable. Viewed, however, as a condition which can be remedied in the future, it holds out much of encouragement. If mistakes in the past make the property unnecessarily expensive to operate, and prevent it from getting all of the business which it is capable of handling, a rectification of these mistakes may well be a wise immediate policy, for it may add so much to the earning power of the property as to make it in time capable of paying its fixed charges and rentals and also a fair profit to its stockholders. There have been recent examples of roads which by improvement in operating methods have overcome situations which on their face were much worse than the Boston & Maine situation. The Erie is a case in point.

The Boston & Maine now for the first time in ten years has a chance to get down to business and devote its energies to efficient, economical operation. Really good freight service on the Boston & Maine would increase the business of that company to a very substantial extent. Efficient operation would permit of the handling of this additional business at little, if any, additional cost. Even Judge Knowlton, as a dissenting director, would probably agree to this diagnosis of the situation.

There is one practical difficulty which still has to be overcome. This is the failure of the New Hampshire legislature to pass laws which will permit the reorganization to be carried out on the plans suggested by the directors. A special session of the legislature could be called, and in all probability would be called, if the New Hampshire leased lines were to manifest a definite desire to come into the reorganization. If they are not thus ready, there is still the alternative of a receivership, leaving the New Hampshire lines out of the reorganization.

The pressing necessity which all parties ought to realize—the stockholders of the Boston & Maine, those of the leased lines, and the New England public—is that the management of the road should be given a chance to operate the property with all the efficiency and economy which is inherently possible. This would be a practical solution of a serious problem which, barring unforeseeable mischances, ought to work out to the benefit of the Boston & Maine common stockholders.

HOW TO MAKE A REAL EIGHT-HOUR DAY

W. S. STONE, W. S. Carter, L. E. Sheppard and W. G. Lee, speaking for the brotherhoods of train service employees which are seeking increases in wages, recently issued a statement to the public entitled, "Why the Eight-Hour Day?" Both its title and the language used in it show that the brotherhoods are very anxious to make the public believe they are asking for a real eight-hour day. For example, the statement says: "All of the leading industries and trades, railroads excepted, have recognized the economic justice of the eight-hour day. . . . If the companies desire to test the sincerity of the men let them prove their belief in what they say and establish the eight-hour day so that the men do not have to make a minute of overtime. . . . The men are not asking for money. They are asking for a shorter workday."

In spite of all their protestations the train service brotherhoods are not asking for an eight-hour day as those words

have been understood by the public up to the present time. Their statement is as bald an attempt to deceive by telling half-truths as has ever come to our notice. The most conclusive way to demonstrate this is to show how many of the most important features of their demands the railways would be obliged to refuse in order to establish an eight-hour day.

Article 1 (a) of the employees' demands provides: "In all road service *100 miles or less*, eight hours *or less*, will constitute a day, *except in passenger service*." Every word we have italicized would have to be stricken out in order to make this demand one for a real eight-hour day. If the employees want a real eight-hour day why do they not present their demand with the italicized words omitted? It would then read: "In all road service eight hours will constitute a day." Why do they insist on wages based on miles as well as on hours? Why do they say "eight hours *or less*"? Why do they say, "except in passenger service?" Why do they introduce all these qualifications and exceptions?

The reason is, that many employees already are working less than eight hours for a day's wage, or for even more than a day's wage, and that the brotherhoods want eight hours made the *maximum* working day, and not the actual working day. For example, on the eastern roads conductors and trainmen in all classes of passenger service are on duty an average of only a little more than six hours a day. If there is to be a real eight-hour day the working day of all these employees must be made eight hours. Again, in western territory engineers in passenger service, excluding those not available for duty and extra men, work an average of only 7.1 hours and firemen an average of only 7½ hours. If a real eight-hour day is to be established the working day of these employees must be made eight hours. In other words, if a real eight-hour day is to be established not only must the hours of those who work more than eight hours be reduced but the hours of those who work less than eight hours must be increased. The employees do not plainly, and without qualification, propose that eight hours shall constitute a day because under such a plan all employees would actually have to work as much as eight hours.

Articles 2 and 3 of the demands relate to yard and switching service and to hostling service. Each of these also provides for "eight hours or less." Why this repetition of the words "or less"? If a real eight-hour day is wanted why not plainly say, "Eight hours will constitute a day's work"?

Perhaps the most significant feature of the demands is Article 4, the so-called "saving clause." This provides, among other things, that "any rates of pay including mileage or arbitrary differentials that are higher, or any rules or conditions of employment contained in individual schedules in effect January 1, 1916, that are more favorable to the employees, shall not be modified or affected by any settlement reached in connection with these proposals." The acceptance by the railways of this provision would be incompatible with the establishment of an eight-hour day. For example, many of the present schedules provide, in effect, that an employee who has been called to perform one class of service, shall be paid a full day's wage, no matter how few hours he may be used; and that if he is asked to perform additional and different service he shall be paid extra. Suppose, now, that the proposed "eight-hour day basis" had been adopted; that this saving clause had been accepted; that a crew had been engaged in switching in a yard for two hours; and that the management should want to send it out to bring in a train whose crew was to be released because its eight hours had expired. Under this saving clause it would be necessary for the management to pay this crew a full day's wage for its work in yard service and additional on an hourly basis for its work in road service, although its work in both classes of service might be finished in less, and even much less, than eight hours. What kind of an "eight-hour day" would that be? Again, suppose that a passenger engineer had made a

run of 100 miles in four hours in through passenger service, and that the management should want to use him for four hours more in suburban passenger service. This would be only eight hours. Under the provisions of the saving clause he would have to be automatically released at the end of his regular run of four hours and the management could not get him to work the other four hours in suburban service without another day's pay. What kind of an eight-hour day would that be under which the management of a concern would be required to give sixteen hours' pay for eight hours' work?

It may be said that completely to abolish the present miles-or-hours basis of pay and replace it with an actual eight-hour basis would be revolutionary. So it would. But the employees are proposing a revolution by demanding the substitution of the eight-hours-or-100-miles basis for the ten-hours-or-100-miles basis. If it is desirable to revolutionize the hourly part of the basis, why is it desirable to go ahead and revolutionize the entire basis and put railway train service wages on the flat hourly basis recognized in other "leading industries"?

Messrs. Stone, Carter, Sheppard and Lee practically challenge the railways to test the sincerity of the employees by putting into effect the eight-hour day. The *Railway Age Gazette* desires to test the sincerity of Messrs. Stone, Carter, Sheppard and Lee. Therefore we submit to them all, and to each of them, the following question: Would you favor and advocate acceptance by the members of your brotherhoods of an eight-hour day schedule which provided, first, that the mileage basis of compensation in railway train service should be abolished; and, second, that eight hours should constitute the working day of all employees in such service? The adoption of these two provisions is absolutely necessary in order to establish a real eight-hour day in railway train service.

Are Messrs. Stone, Carter, Sheppard and Lee sincere in saying they want a real eight-hour day? If so, they will hasten to answer the above question in the affirmative. The public has a right to have the question answered; and the leaders of the brotherhoods will never have been frank in dealing with the public until they have answered it.

NEW BOOKS

Regulation of Railroads and Utilities in Wisconsin. By Fred L. Holmes, Madison, Wis. 375 pages. 5½ in. by 8 in. Published by D. Appleton & Co., New York, N. Y. Bound in cloth. Price, \$2.

Railroad and public utility regulation has probably attained a higher degree of development in Wisconsin than in any other state in the Union, and the Wisconsin Railroad Commission has generally been regarded as one of the best of the state commissions. This fact lends especial interest to a presentation of the important facts of the history of regulation in Wisconsin and a review of the methods followed by the present commission since its organization in 1905, written by one who as chairman of the assembly committee on transportation has been in a position to keep closely in touch with its work.

The author frankly states in his preface that if there be any bias in his work it is in favor of the present system. He has apparently obtained most of his information from the commission itself and from its files, and from public addresses of commissioners, without making much effort to ascertain the point of view of the regulated railroads and utilities; but as an exposition of the work of the commission, of its methods of operation and the principles on which it has acted, the book is unusually interesting and should be of great value to any student of state regulation.

The Wisconsin commission has unusually broad powers over rates, service and capitalization of railroads, as well as utilities, including the power to fix absolute rates; its members are appointed and it has had the advantage of a greater

continuity of personnel than most commissions of the kind. It has carried to a far greater extent than any other commission the idea of making rates by mathematical formula, based on a valuation of property and studies of cost of service, but tempered with judgment as to the many other factors affecting rates which are usually considered by railroad men. The most interesting chapters of the book are those dealing with the commission's organization and its procedure in making the valuations and in applying its mathematical methods to actual rate problems, which are very thoroughly described.

The extent to which mathematics pervades the work of the commission is even reflected in the author's discussion of it. He says that "ordinarily two hours of one commissioner's time is required every day to settle rate problems. In that time from 20 to 100 rates are made or remade—an average of about 40 a day." And in summing up the results to the public of the commission's work he calculates that for eight years the average yearly expense of the commission to the people of the state has been four cents per capita, or less than \$100,000, while it has effected a direct annual saving by rate reductions of \$1.34 per capita, "an average annual return of \$1.30, or 3.250 per cent on the amount invested." This is a somewhat liberal return as compared with the 7 per cent which he says the commission under normal circumstances intends to allow the railroads. He says that of the cases brought before the commission thus far the records show that between 90 and 95 per cent are decided in favor of the public, and that in the eight years ending June 30, 1913, during which the commission has had jurisdiction over the railroads, "the savings in freight and passenger charges to the public have approximated \$2,400,000 annually." In view of the author's enthusiastic approval of the commission it seems rather surprising that he should include in this saving—as he does—the effect of the enactment of the two-cent fare law by the legislature in 1907, after the commission had established a rate of 2½ cents, and its members had vigorously opposed 2-cent fare legislation.

One chapter of the book is devoted to the regulation by the commission of municipal utility plants, in which it has found an even greater field for its offices with respect to rates, service and accounts than in the case of the privately owned utilities. On the whole, the book is one of the best that have been published on the subject of public regulation, and confirms the general impression regarding the intelligence and fairness which usually have characterized the work of the Wisconsin commission.

New York Central Railroad; 1831-1915. Pamphlet. 5½ in. by 7¾ in. 31 pages. Issued by the railroad company, New York City.

The 31 pages of this little book contain an unusually entertaining compilation of historical notes, brought down to date. The book has been prepared primarily for the stockholders of the company, to each of whom a copy has been sent. The preface, signed by President A. H. Smith, suggests that any one who is a part owner in such a gigantic institution ought to take sufficient interest in his property to desire to know something of its origin and of the birth of the 186 predecessor companies of which the present New York Central is made up; and the 25 brief chapters are well calculated to satisfy the curiosity thus aroused. We have called it history, and so it is; but more than half the pages deal with the rapidly formed history of the last half dozen years—facts which to the stockholder are, or should be, not only deeply interesting, but also of real importance, if he is to be an intelligent capitalist. Not the least entertaining and instructive feature of the work is the score of illustrations.

RAILROADS OF NORTHERN RUSSIA.—The section of the new Murman Railroad running from Kola on the Bay of Alexandrovsk to Kandalaksha on the White Sea was to be opened for traffic about February 15, 1916.

A Modern Terminal Layout for Passenger Equipment

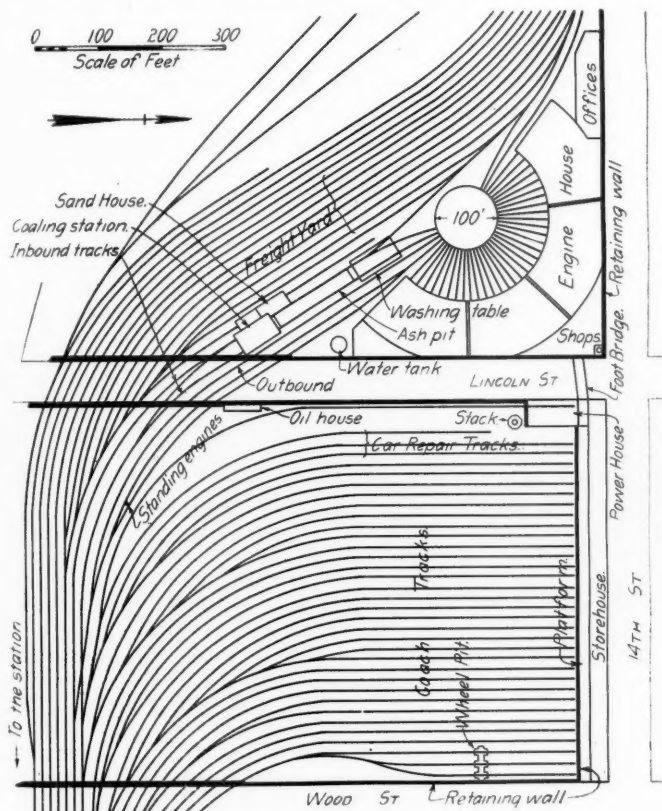
A Description of the Complete Facilities Just Finished by the Baltimore & Ohio Chicago Terminal

The Baltimore & Ohio Chicago Terminal has just completed an engine and coach terminal in Chicago for the use of its tenants, the Baltimore & Ohio, the Chicago Great Western, the Minneapolis, St. Paul & Sault Ste. Marie, and the Pere Marquette, which presents many features of interest. Occupying valuable property selected because of the desirability of a location as near the passenger station as possible, the new terminal represents an excellent example of the intensive use of the ground available in the heart of a city and embodies a number of new developments in facilities of this character. Inadequacy of the existing facilities and the fact that they occupied space needed by the Pennsylvania Lines for facilities to be displaced in the construction of the proposed Chicago Union Station, are the principal reasons for this work. Incidentally, the construction work has been carried on jointly with a project to provide additional track-

necessary to elevate the new terminal also. This involved a large amount of filling, the construction of 3,200 ft. of retaining walls and abutments and the material extension of the subways at Wood and Lincoln streets, 18 tracks being carried over Lincoln street.

THE COACH YARD

Special attention was given to the design of the coach terminal with the result that it is very complete and conveniently arranged for the purpose. It includes a yard with a capacity of 300 coaches, with 3 tracks for car repairs, 28 for cleaning and 3 for wheel and truck repairs. Ellis bumping posts are placed at the ends of all the yard tracks along Fourteenth street in front of a coach yard store house built on the entire frontage of the block. The wheel and truck repair tracks are spaced 21 ft. center to center and the car repair tracks are respectively 14 and 15 ft. center to center. The 28 tracks for car cleaning are spaced alternately 14 and 18 ft. center to center with concrete walks, curbs and gutters between each pair of tracks. These walks are all connected with a platform fronting on the entire length of the store house, thus affording convenient means for transporting supplies from the store house to any car in the yard. It is pro-



Map of the Engine and Coach Terminal

age for the Baltimore & Ohio Chicago Terminal east from the new terminal as far as Halsted street, a distance of 1½ miles.

The site selected for the terminal is a triangular piece of ground with a frontage of 1,250 ft. on Fourteenth street and 800 ft. on Wood street. The city vacated Fifteenth street between Wood street and Lincoln street, but it was necessary to keep Lincoln street open and this separates the engine terminal located on the west side from the coach terminal located on the east side. The new engine terminal occupies the site of an old round house formerly used for switching and transfer engines, but the block bounded by Wood, Lincoln, Fourteenth and Fifteenth streets occupied by the coach yard was purchased recently for the purpose. The tracks of the road having been elevated previously, it was



View of the Store Building and Coach Yard

posed to provide electric motor trucks operated either with or without trailers for this service.

Adequate provision has been made for drainage and lighting. At intervals of 150 ft. the tracks are drained to catch basins located between each pair of tracks and connected to lines of sewers running at right angles with the tracks. The yard is lighted by 2,500 volt series arcs mounted on iron poles placed at intervals of 150 ft. in each direction. Fire protection is provided by a fire line surrounding the yard, with hydrants at intervals of about 200 ft.

Steam for car heating and compressed air for charging brakes are provided for convenient connection to train pipes at the end of each track. Manholes at intervals of 75 ft. in the platforms provide hose connections for washing cars. These are equipped with 1-in. Volkhardt valves and risers to reduce the possibility of freezing in cold weather. Pintsch gas is provided along every fourth track by a pipe line 450 ft. long lying on the surface with hose connections at intervals of 90 ft. Electric outlet boxes are provided in each 18-ft. space at intervals of 150 ft., two boxes being provided at each point, one next to each curb line. Each box contains two outlets, one for vacuum cleaners and the other for charg-

THE ROUNDHOUSE

The roundhouse contains 33 stalls, the maximum number it was possible to provide in the triangular area available. It presents an unusual appearance for a round house because the exterior walls follow the building lines of the two streets and the wall on Fourteenth street is made continuous with that of a small office building located just west of the round house. Because of this arrangement the stalls vary in length from a minimum of 90 ft. in the middle of the two sides to a maximum of more than 100 ft. in the corners. This difference in length, however, does not take up all of the available space in these corners, particularly at the street intersection where a space extending 135 ft. on each street is used for a machine and blacksmith shop, tool room, toilet rooms, etc. A smaller space in the southeast corner is occupied by two automatic electric centrifugal pumps which serve as a booster for the supply from the city main to the water service tank.

The house is divided into four separate rooms by fire walls which are of brick 13 in. thick except for a distance of 25 ft. at the front, where an 8 in. reinforced concrete wall is used to secure greater clearance. Communication between the several rooms is provided by 8 ft. by 8 ft. openings near the outside walls, equipped with tin clad rolling fire doors. A timber frame of slow burning construction is used, with a departure from the usual practice in the use of cast iron hangers for the beams in place of wrought iron or steel as affording greater security under the action of corrosive gases existing in round houses. The track doors are provided with wooden slat rolling doors furnished by the J. G. Wilson Corporation, Roanoke, Va., which necessitated the use of special structural steel columns between the doors, having I-sections and widened tops to serve as guides for the doors and to provide space for the door in the rolled-up position at the top. Light is provided by large Fenestra sash windows in the outside walls and pivoted wooden sash windows in the clearstory. One 18-in. Dickinson Acolus cast-iron ventilator is provided for each stall.

The engine pits are entirely of concrete with 80-lb. rails supported at intervals of 3 ft. on 6 in. by 10 in. wooden blocks set in the tops of the walls. The walls are recessed

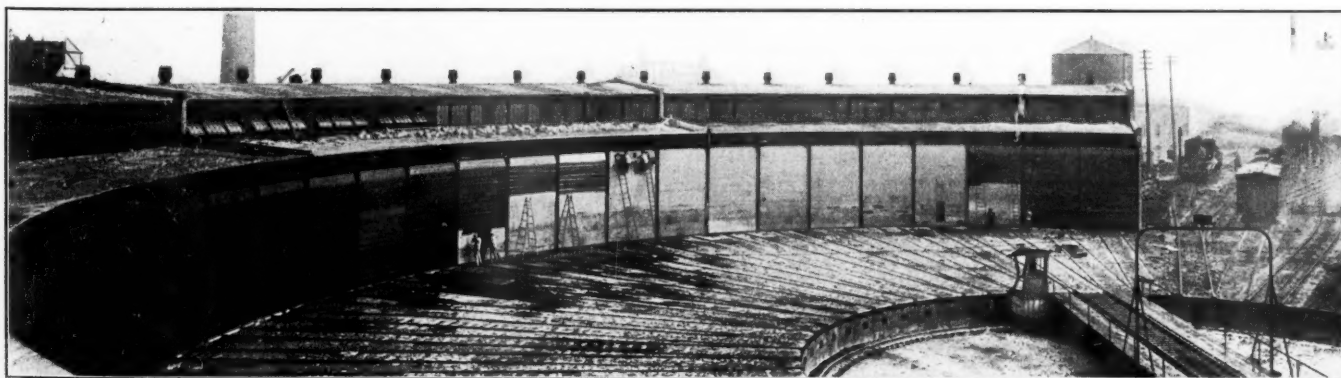
In a location convenient to the machine shop a truck wheel and a driving wheel removal pit are provided, each embracing three engine pits. The wheel removal pits are of the type having a jack or ram traveling in a carriage on a circular track so that wheels may be transferred conveniently from an engine on one track to the track in an adjoining stall. The track in the stall crossing the center of the driving wheel pit extends into the machine shop for convenience in transferring wheels to the lathe.

The round house is equipped with a smoke exhauster, following the practice adopted in several other round houses in



The Office Building and Roundhouse, from the Intersection of Robey and Fourteenth Streets

Chicago. Smoke from the engine stacks is taken up by Dickinson cast iron ball and socket telescopic jacks and exhausted through a smoke duct following the circle of the clearstory by two fans located on the roof of the machine shop to a Heinecke radial brick chimney 156 ft. high and 6 ft. in diameter. The duct in the house is of square section varying from 3 ft. to 5 ft. on a side. The connection from the fan to the chimney, $4\frac{1}{2}$ ft. by 10 ft. in section and one-half of the duct in the circle of the house, is a Dickinson cast iron



The Roundhouse and Turntable

$3\frac{1}{2}$ in. for the entire length on each side to provide space for cast iron steam heating radiators. For drainage the bottoms of the pits are crowned transversely and slope 6 in. from the rear to the front. They are arranged in groups of three with the pit on each side draining through a 6 in. cast iron pipe to a catch basin at the end of the middle pit. This catch basin in turn drains into an 18 in. vitrified pipe following around the circle of the house just outside of the doors. At the rear of the house, connecting the ends of all at the engine pits, is a pipe duct containing the blow-off line, steam heating vacuum return pipe and the fire main.

The duct in the other half is made of Johns-Manville asbestos board. These two types of ducts are being advocated for this purpose and it was concluded to make use of each kind for comparison. The fans are New York Blower Company induced draft fans with 84 in. by 48 in. wheels. They are connected to independent motors and are intended to operate one at a time. Space is provided for a washer and precipitator should either be found desirable. A Miller hot water locomotive washout and refilling system has been installed.

A 100-ft. turntable of the American Bridge Company's

standard deck type with a roller bearing center is installed with a Nichols electric tractor.

OTHER FACILITIES

The office building west of the round house is a one-story structure 164 ft. long and 46 ft. 6 in. wide. It contains offices for the master mechanic, round house foreman, road foreman of engines, callers, yardmaster, local freight agent and clerks. There are also locker and toilet rooms for the clerks, enginemen and switchmen. The building has brick exterior walls, 4-in. tile partitions and a composition roof on wooden sheathing and rafters. The suspended ceiling is plaster on metal lath and metal joists. A concrete stair well extends down into the fill to provide communication with the street at the sidewalk level.

A definite limit on the space available made it imperative that the auxiliary engine facilities occupy as little space as possible. As a result a very compact layout was obtained which includes a 1,000 ton capacity coaling station, a 300 cu. yd. sand house, a two-track ash pit 150 ft. long and a two-track locomotive washing table 75 ft. long.

As seen in the accompanying map, the round house lead consists of six tracks, two for standing engines, one outbound, two inbound and one for loaded cars to serve the coaling station and sand house. With the exception of the water tank, all of the facilities mentioned above are grouped along the two inbound tracks in a distance of 310 ft.

The coaling station is of the Ogle counterbalanced bucket type with buckets descending into a pit of sufficient depth to receive coal from the coal car track hopper by gravity and rising to a height that will permit the coal to be spouted into seven pockets having capacities ranging from 80 to 240 tons each, the total capacity being 1,000 tons. The station is built directly over the two inbound tracks and six of the pockets, three at each end, are equipped with spouts serving each of these tracks. The middle pocket with 240 tons capacity, has its bottom sloping toward the outbound track and is provided with spouts for serving that track as well as the two inbound tracks.

The cinder pit is of the submerged pit type. As seen in the accompanying drawing, there are two tracks over the pit, each with one rail carried on a side wall and the other rail supported over the pit on girders consisting of two 20-in. I-beams encased in concrete and carried on concrete piers 13 ft. 11 in. center to center. The girders for the two tracks are 15 ft. apart. The floor of the pit immediately under each track slopes down toward the center of the pit on an angle of about 45 deg., while the floor of the portion of the pit between tracks has a flat bottom. Ashes will be removed from the pit by a clam shell bucket operated by a locomotive crane standing on either of the two tracks. Rails are embedded in the bottom of the pit with their heads projecting slightly as a protection from the bucket.

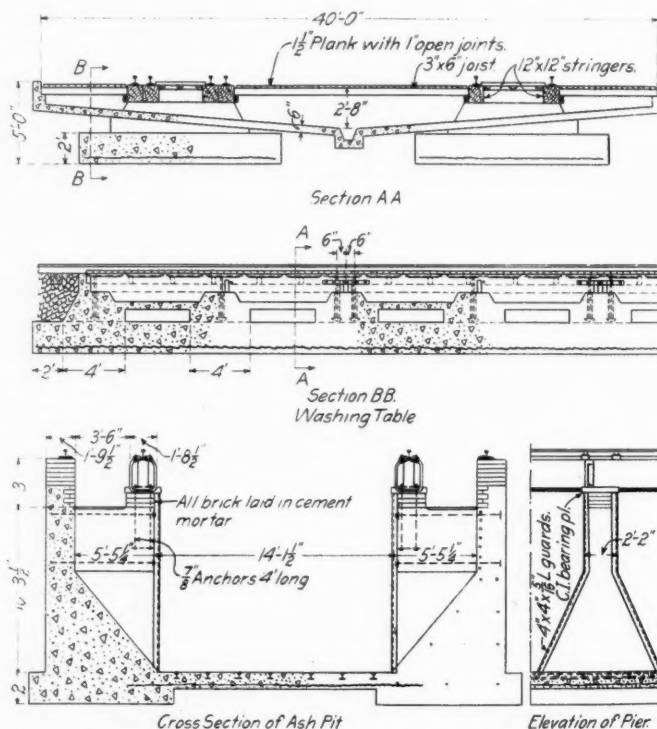
Beyond the ash pit is a locomotive cleaning platform on which the locomotives are washed with a spray of oil, water and steam. This platform consists of a concrete pan or basin 82 ft. long by 40 ft. wide with a sloping bottom having a maximum depth along the longitudinal center line of 2 ft. 8 in. below the base of rail. Two tracks and a turnout are carried over this basin on 12 in. by 12 in. stringers spanning between concrete piers 8 ft. 2 $\frac{3}{4}$ in. center to center. The whole is covered by a platform of 1 $\frac{1}{2}$ in. plank laid with 1-in. spaces between, supported by the track deck and arranged for easy removal. Three manholes are provided to contain the necessary valves for the supply of hot and cold water, oil and steam, and a catch basin connected to the gutter in the center of the basin affords the necessary drainage. A 100,000-gal. steel water tank with an elliptical bottom of Chicago Bridge & Iron Company design with three Fairbanks Morse water columns, one near the cinder pit between the inbound and outbound tracks, one on a track ap-

proaching the turntable from the west and a third adjacent to the outside standing engine track are also provided.

The oil house is located on the east side of Lincoln street near the tracks approaching the round house convenient for both the engine and the coach terminals, with a working room on the track level and a tank room in a basement underneath. Oil is supplied from cars on the power house track alongside but a gasoline tank buried in the embankment is provided with connections to permit taking gasoline from a wagon in the street.

SPECIAL FEATURES

The foundation conditions are unusual. Natural foundations at the site were found satisfactory for all structures, except the turntable where 16 reinforced concrete piles 30 ft. long were used. An unusual situation was introduced by the fact that the terminal is all elevated on a sand fill and that with the exception of the coach storage building, oil house, coaling station and one corner of the round house, there was no occasion for the basement extending down into the embankment under any building. It was thought at the



Sections Through the Ash Pit and the Washing Table

start that it would be necessary to support these buildings on long columns extending through the fill to natural foundations at the original ground level. After some study it was decided to use spread foundations giving a bearing pressure not in excess of one ton per sq. ft. and thus support these structures on the sand fill instead of going to the expense of carrying the foundations through it. This resulted in a material saving and has thus far developed no disadvantages, even with the round house and the office building, which are supported partly on the top of the retaining wall and partly on the sand fill. As a precaution, the filling was thoroughly flooded before building on it.

The construction work was carried on with unusual rapidity. Work on the building was started on August 1, 1915, and was completed on schedule time on December 15, when it was turned over to the operating department for occupancy. The work was handled under the general direction of F. L. Stuart, chief engineer of the Baltimore & Ohio Chicago Terminal, and under the immediate direction of L. G. Curtis, district engineer, F. E. Lamphere, assistant engineer, and F. S.

Harvey, resident engineer. The plans were prepared under the direction of M. A. Long, assistant to the chief engineer of the Baltimore & Ohio. James Stewart & Co., and the Drumm Construction Co., Chicago, were the general contractors for all building work.

INVESTIGATION OF THE BALTIMORE & OHIO DERAILMENT AT EIGHTYFOUR, PA.

H. W. Belnap, chief of the Division of Safety of the Interstate Commerce Commission has issued a report on a derailment occurring on the Baltimore & Ohio at Eightyfour, Pa., on April 30, 1915. This line is single track at this point. The derailment occurred about 120 ft. from the departing end of the easement to a 9 deg. 22 min. curve on a level grade. The track at this point was laid with 30 ft. 85 lb. rails supported by 17 oak ties under each rail. The train derailed was a fast freight train of 24 loaded cars hauled by two locomotives. At a point about 150 ft. east of the station at Eightyfour the rear tender truck of the first locomotive was derailed, followed by the second locomotive and six cars. At the time of derailment the train was moving at a speed of 20 or 25 miles per hour with the first engine drifting and the second engine using a little steam.

An examination of the track showed that it was maintained in good condition and that the derailment was caused by a broken rail on the right side of the track. The first fracture was 26 ft. from the receiving end of the rail, and the second fracture 38 in. further east or just outside the splice bars. The section between the two fractures, 38 in. in length, had an irregular line of rupture extending along the web about half way between the head and the base.

James E. Howard, engineer physicist of the commission, made a detailed examination of this rail and the following discussion is taken from his report. The rail was an 85-lb. A. S. C. E. section, rolled by the Carnegie Steel Company in 1904 and laid on the New Castle division the same year. In 1914 it was taken up and 18 in. sawed off each end. It was relaid at Eightyfour, February 2, 1915.

Chemical analysis showed the rail to come within the specification requirements for Bessemer steel and showed no segregation. Other parts of the rail appeared sound with no surface indications of defects in the web.

An inspection was made of other rails in the same vicinity for surface indications of defects which might lead to similar fractures and some rails in which there were seams in the web in different stages of development were removed for investigation. Studies were also made of a number of new rails which had not been in service; of some which had been exposed to high wheel loads experimentally applied; of several which had been exposed to ordinary conditions of high speed, main line track, some of which had developed transverse fissures; and of rails which had sustained high tonnage in the aggregate, but under comparatively low wheel loads. A total of 13 rails were examined in addition to those taken from the B. & O. track in the vicinity of Eightyfour.

The purpose of the examination was to ascertain the extent to which stresses arising from cooling strains of fabrication, cold-rolling strains from wheel loads and from direct loading in the track combine to form the total which the rails in service are called upon to withstand. To determine these stresses the different rails were examined to ascertain the strains existing in various portions of the sections and accurate measurements were taken of the changes in lengths of the sections under test to indicate the stresses to which they had been subjected. These investigations indicate that the initial strain in rails from cooling during fabrication and from cold-rolling by wheel loads in the track and the strains which attend the direct loading of the rails appear to possess the same characteristics. Meager data are available regarding the direct stresses in the track while there is an almost

entire absence of information regarding cooling strains and cold-rolling strains in rails although the influence of initial strains has long been recognized in certain other engineering structures. These investigations confirm the belief that the three component strains are of the same order.

The shape of the cross section of a rail renders it susceptible to initial strains in cooling. By augmentation from wheel pressures the initial strains in the head exceed those in the base after the rail has been in service, also these conditions may be disturbed at least locally. Initial strains from cooling introduce opposing strains of tension and compression in the metal at the lower surface of the base, which remain in rails in service. The range in stress from tension to compression in a new rail of 120-lb. section is shown to have been 13,200 lb. per sq. in. and in a rail of 125-lb. section after a short period in service 16,200 lb. Longitudinal shearing strains must be set up where such opposing forces are found and so far as they have an effect on the rail they would appear to promote base fractures.

In respect to the endurance of steel to repeated stresses it is known that by increasing the fiber stresses the number of repetitions necessary to cause rupture will be decreased. It follows that the introduction of initial strains by cooling at the time of fabrication, together with cold-rolling strains from the wheels, should impose limitations on the direct bending stresses in the track. That is, they should limit the number of times the rail may be loaded and restrict the amount of the wheel loads which may be borne without rupture.

Longitudinal strains were investigated in these rails. Rails are exposed to lateral flow in the metal of the head, setting up shearing strains. It not infrequently happens that shearing fractures accompany other fractures, two types being present in the same part of the rail. This happens notably, in the case of the development of transverse fissures, associated with which at times are shearing fractures, the latter developing in longitudinal planes. Wheel pressures which lead to one type of rupture necessarily have a tendency to cause one also of the other kind.

There is a limit to the endurance of all grades of steel. It does not avail to discuss the production of steel of physical properties far in advance of present metallurgical knowledge and skill. For the present the stresses in steel rails should be limited to loads which are safe for steel of current manufacture. The basis of engineering practice is, or obviously should be, knowledge of what constitutes the safe loads; an accurate definition of the loads which the structure will be called upon to sustain; and restrictions of the stresses to limits in which a reasonable margin is maintained between the working stresses and the loads which will surely end in rupture.

The fracture of the web probably owed its origin to a surface seam which under traffic conditions gradually extended in both depth and length until the fracture of the web was three feet long. In this weakened condition of the rail the weight of a locomotive was sufficient to complete the fracture and make an opening in the track.

Other rails were found on the webs of which were surface indications which would, it was thought, lead to such fractures as witnessed in the failed rail. A partially fractured web was revealed in one of these rails. In another rail, which showed less pronounced surface seams, the case was shown to be laps in the metal, and these in turn were attributed to mill conditions to some of the passes of the rail in the rolls. A common cause for these surface indications and the incipient stages of the fracture of the rail which failed is probably found in these laps. They admit of detection by inspection, and danger is incurred by accepting rails with such laps on their surfaces.

Many of the laps examined had not extended beyond their original limits. Their depth of penetration, after having been in the track does not admit of determination without destroying the rail until the crack becomes visible on both sides of

the web. In some cases there were laps on both sides, and when opposite each other inspection in the track would not indicate whether the laps were united or not. A state of uncertainty exists where such surface indications are present.

Information upon the direct stresses, those due to the presence of the train on the rail, is very limited, while the initial strains of fabrication and those introduced by the cold rolling of the wheels are factors which have been practically overlooked. They constitute important factors, and no inquiry into the stresses which affect rails can be regarded as complete which does not take them into account.

UNDESIRE ADVICE FOLLOWED; FORTUNATE CONSEQUENCES*

By W. E. Schott

Section Foreman, Southern Pacific, San Miguel, Cal.

An example of how a section foreman was cured of taking chances and of how thankful he was that he had followed somebody else's advice, even with reluctance, occurred not long ago on one of our western standard railroads.

The foreman in question, starting out for his day's work, found a defective rail in the main track. He unloaded his tools, pumped his handcar to the nearest rail rack and, returning with a new rail, he met the lineman, who had stopped his motor car where the foreman had left his tools.

"Going to tear up the railroad, Bill?" asked the lineman, jokingly.

"Yes, part of it," answered the foreman, while his four men dumped the rail off the car and then took the car off the track.

"Tell your flagman to get on behind me, Bill," the line man continued, pushing his motor, ready to start, "and I will take the flagman out with me; it will save him walking."

Now, the piece of track where this conversation occurred was equipped with automatic block signals and the foreman had been in the habit of depending on those block signals when changing a rail. The job only required a few minutes' time, his crew was small, and he knew those signals would go to stop as soon as he loosened a joint. He, therefore, had never thought it necessary to send out flagmen in both directions, though not to do so was a direct violation of rules. When Jack suggested to take out a flagman for him, it was on his lips to remind the lineman to attend to his telegraph wires, and not be butting in; but on second thought he kept quiet. He knew that he was supposed to protect his work with a flag, block signals or no block signals; and while it went against the grain to obey this admonition, he realized that he couldn't afford to let an outsider know of his usual risky practice. It was evident, also, that the lineman made his suggestion without any intention of giving advice, taking it for granted that the foreman would send out flagmen of his own accord. Bill, therefore, called one of his men, gave him a flag and torpedoes and instructed him as to what to do; and sent him along with the lineman, who was going east. Towards the west the track was straight for nearly two miles and an approaching train could be seen for two miles more. An east-bound intermediate block-signal was in plain sight about a quarter of a mile west of his work; and, no regular train being due for quite a while, he started his gang pulling spikes and loosening the joint bolts. Cutting the bond wires, they pushed the bad rail out of its place to make room for the new one, when the foreman looked up and turned his eyes along the track towards the west. He looked harder, scarcely believing his own eyes; there was that intermediate east-bound signal

showing a clear track; and here, only a quarter of a mile east of it, he had a rail out and no flagman west of him.

He didn't know what to make of it; neither did he have time to do much thinking; for just then he heard an engine whistle. It was an extra from the east; and Bill thanked his stars that he had listened to the lineman's advice and had sent out a flagman in that direction at least.

He and his men worked feverishly, but on account of the joints all being rather tight, he had to do some driving before he could slip the rail in its place. The train, having been flagged, had slowly come ahead, stopped a few rail lengths from the gang, and the engineer and a brakeman watched them tightening the last bolt, not dreaming that only a lucky circumstance had saved their train from a serious wreck.

Bill investigated afterwards about the queer actions of that block signal. He found out that such cases had happened before. Right then and there he made and ever since kept the resolution, under no circumstances to take any more chances; but always to enforce with himself "Safety-first."

The lineman he met often afterwards; and while Bill never told how grateful he was for that undesired advice, Jack often wondered what had made Bill so agreeable and accommodating since the day when he passed him changing that rail.

THE PROPOSED TRAIN LIMIT LAWS*

By J. A. Droege

It requires no extended technical knowledge of railway operation to convince any intelligent and reasonable person that safety increases as the number of trains on a given section of road decreases. In all of its exhaustive studies, the Interstate Commerce Commission has never cited a single instance where the number of men on a train; the number of cars in a train or the number of engines hauling a train, in any way contributed to the cause of an accident. It has been suggested that the train limit bills before the legislatures should be entitled: "An act to increase the cost of rendering transportation service to the public and to add to the number of people killed and injured on railways." In 1904 there were 613 trainmen killed in collisions and derailments and 4,337 injured; and in 1914 the numbers were 391 and 3,452 respectively. Contrast this with the number of tons per train for these years; 308 and 452. There were 606 million revenue freight train miles run in 1914 as against 535 million in 1904; and 20,796 million freight car miles in 1914 as against 14,353 million in 1904. The statistics of the Interstate Commerce Commission show that the increased length of freight trains, which, generally speaking, was accomplished without unnecessarily increasing the number of "joy riders" on such trains, tends to decrease loss of life and injury to employees engaged in train operation.

After all, the economic aspects of railway operation require a study and analysis of the number of cars, or number of ton-miles *per casualty* rather than a study based on accidents per train run, or per train mile. As an indication of what such an analysis reveals, let us take the figures of trainmen killed in "collisions and derailments." In 1904 there were 23.4 million freight car miles made for each trainman killed; in 1914—ten years later—with 50 per cent increase in train load, 53.2 million freight car miles were made for each trainman killed. The ton mile figures for this item—and the real measure of work performed—are even more significant; one trainman killed in 1904 for every 284.7 million tons hauled one mile, and in 1914, one for every 737.4 million tons one mile. Heavier car loading contributes to increased efficiency as well as heavier train loading.

*A paper received in the Safety-First Competition. Other papers were published January 28 and February 11.

*Extract from an address before the New Haven Railroad Club.

Pulverized Fuel for Locomotive Service*

It Affords a Means of Further Increasing Steam Locomotive Capacity; Essential Features of the Equipment Used

By J. E. Muhlfeld

President, Locomotive Pulverized Fuel Company.

For the purpose of quickly conveying to you my reasons for believing that the burning of solid fuels in a pulverized form is the most promising solution of our fuel problems, and that it will become the generally adopted method for generating power in steam locomotives, the following facts and conclusions are set forth:

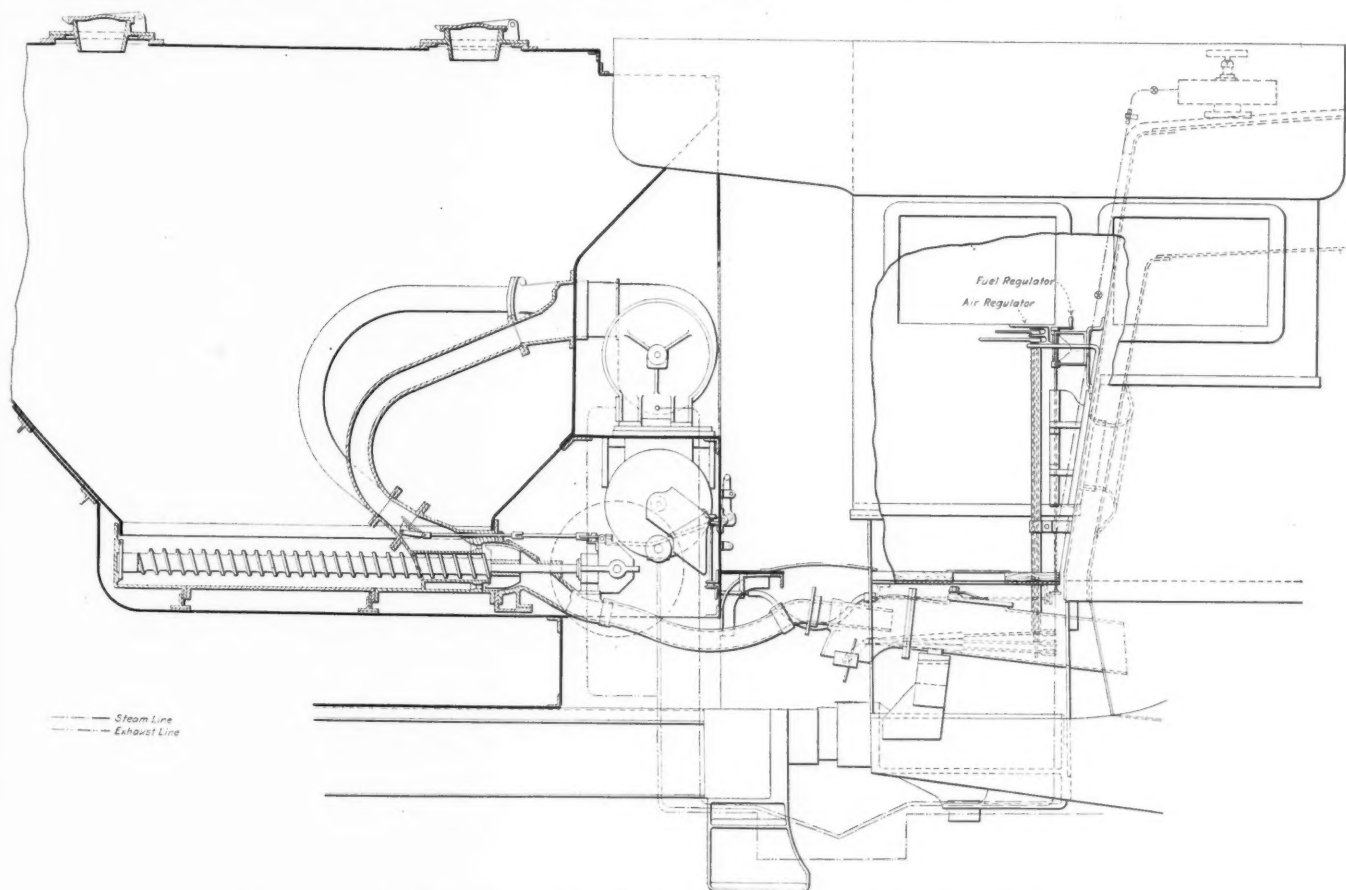
First.—Present annual consumption in the United States of about 7,000,000 tons of solid fuel in pulverized form, in industrial kilns and furnaces, has demonstrated the effectiveness and economy of this method of combustion.

Second.—The expenditure for locomotive fuel is, next to labor, the largest single item of cost in steam railway operation. The Interstate Commerce Commission reports that this

of internal combustion, compressed air, hot water, storage battery, and electric locomotives dependent upon an outside source of power, for the general movement of heavy traffic.

Fifth.—The quantity of steam used by the modern locomotive necessitates high rates of evaporation, and this can only be obtained economically by some means for burning solid fuel other than on grates, in order to reduce the waste of coal containing a large percentage of dust and that from imperfect combustion, to eliminate fire hazards, to conserve cylinder tractive efforts and to improve the thermal efficiency of the locomotive as a whole.

Sixth.—Shallower seams of coal; mechanical and powder methods of mining; greater security demanded for labor;



Arrangement of Steam Turbine-Driven Pulverized Fuel Burning Equipment

expense for the fiscal year ending June 30, 1915, was \$249,507,624, or about 23 per cent of the transportation expense of 242,657 operated miles of steam railways in the United States.

Third.—Necessity for conserving the limited supply of oil in the rapidly exhausting fields, for other than locomotive purposes, will shortly eliminate it from railway motive power use.

Fourth.—Present requirements for reliable and flexible motive power of relatively low first cost, and expense for fixed charge, maintenance and operation, precludes the use

high cost for developing, tunneling, timbering, pumping, ventilating and inspecting mines; scarcity of, and higher wages for labor, and more rigid legislative rules and regulations will rapidly increase the cost for solid fuels.

Seventh.—Proper co-operation between the railways and the mine operators will necessitate that the former shall make use of the constantly increasing percentage of dust, slack, screenings, and other small sizes of gas, soft and anthracite coals, as well as of coke breeze, lignite and peat which cannot now be effectively or economically burned on grates in locomotives.

Eighth.—Steam locomotives must be equipped to more nearly approximate the electric locomotives as regards the

*From a paper presented before the New York Railroad Club, February 18, 1916.

elimination of smoke, soot, cinders and sparks; reduction of noise, time for despatching at terminals, and stand-by losses, and to increase the daily mileage by producing longer runs and more nearly continuous service between general repair periods.

Ninth.—Labor of a higher average standard should be induced to enter the service as firemen by reducing the arduous work now required to fire modern steam locomotives of great power.

Tenth.—The future steam locomotive will be required to produce the maximum hauling capacity per unit of total weight, at the minimum cost per pound of drawbar pull, and with the least liability for mechanical delay.

These conditions as outlined can generally be met through the use of pulverized fuel. Its use offers opportunity for even greater accomplishment in the steam railway field than has been obtained through its use in cement kilns and metallurgical furnaces. A saving of from 15 to 25 per cent in coal of equivalent heat value fired, results from its use, as compared with the hand firing of coarse coal on grates. As pulverized fuel may run as high as 10 per cent in sulphur and 35 per cent in ash and still produce maximum steaming capacity, and as otherwise unsuitable and unsalable or refuse grades of fuel may be utilized, the saving in first cost, per unit of heat will be a considerable additional item. The most severe test* that has yet been made was with some semi-bituminous coal from Brazil, South America, analyzing when pulverized:

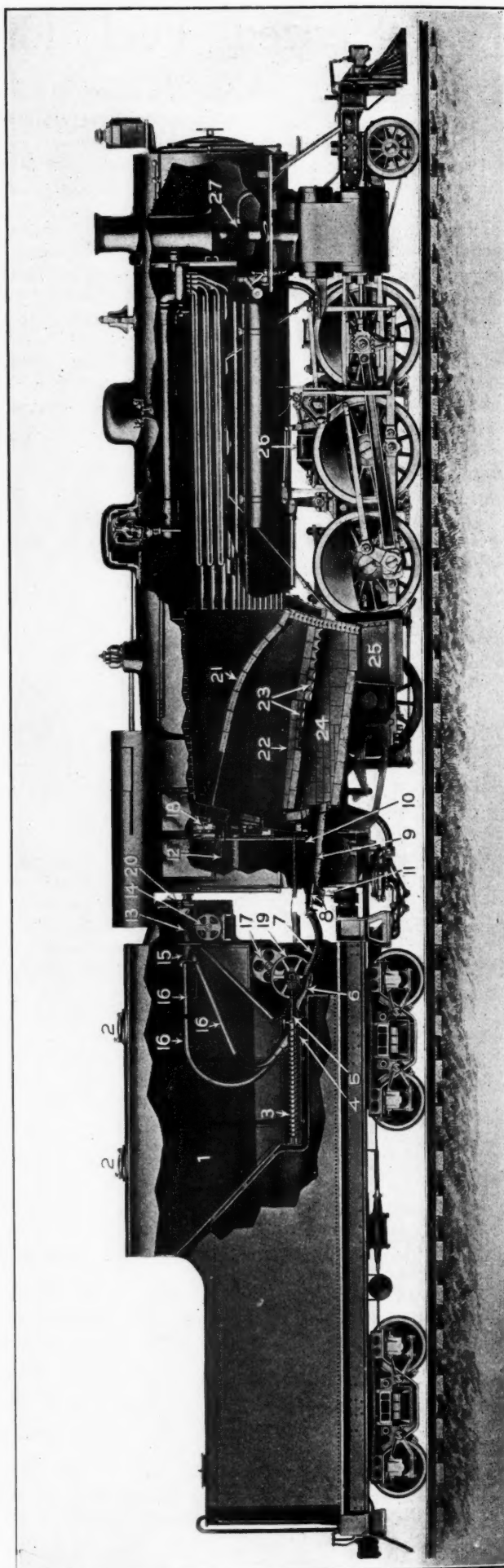
Moisture	from 2 per cent to 8 per cent
Volatile	from 14 per cent to 28 per cent
Fixed carbon	from 58 per cent to 34 per cent
Ash	from 26 per cent to 30 per cent

The sulphur averaged from 3 per cent to 9 per cent and the heating value from 10,900 B. t. u. to 8,800 B. t. u. No difficulty whatever obtained in maintaining maximum boiler pressure when working the locomotive with this fuel under the most severe operating conditions.

The use of pulverized fuel enables firebox temperatures and sustained boiler capacities to be attained equivalent to and exceeding those obtainable with crude or fuel oil. It eliminates waste products of combustion and fire hazards, and permits the enlargement of exhaust steam passages, thus producing increased efficiency of the cylinders. Pulverization permits of the use of such fuel as cannot readily be disposed of by mine operators in the commercial trade, and provides for the utilization of existing refuse, and of lignite and peat. It renders possible the elimination of smoke, soot, cinders and sparks, and increases the time available for transportation use. It dispenses with the necessity for grates, ashpans and trailing trucks, thereby increasing the percentage of total locomotive weight available for the development of drawbar pull.

Commencing with Richard Trevithick's locomotive, which was built in 1803, and was the first to actually perform transportation service, the general practice has been to burn wood, coal and other solid fuels in locomotive fireboxes on grates. However, during the past twenty-five years the continued advance in locomotive tractive effort has so increased the required rate of combustion that the quantity of fuel now used per unit of work performed is far beyond what a more effective means will produce. While great progress has been made in the superheating and use of the steam, the principal improvements that have been perfected in steam generation have been through the enlargement of heating surfaces, better circulation of water, regulation of air admission and the use of fire-brick arches. The locomotive boiler is responsible for, and involves the greatest proportion of inspection, cleaning, maintenance, liability for damage, and expense that obtains in the operation of steam railway motive power, but it has probably received the least consideration as regards improve-

*For a discussion of the results of tests with pulverized fuel in locomotive service see the *Railway Age Gazette* for April 30, 1915, page 941.



Locomotive Equipment for Burning Pulverized Fuel—See Table for Names of Parts

ment in its general efficiency. Today it is subjected to the most criticism from the general public as the result of the smoke, soot, cinders, sparks, ashes and the noise that it produces.

Experimenting with coal dust for fuel dates as far back as 1818, although its actual industrial application in the United States did not begin until 1895, when the advance in the price of fuel oil led to its use in cement plants. The Manhattan Elevated Railroad in New York City made some experiments with the use of coal dust in one of its locomotives about fifteen years ago, the pulverizing of the fuel and the discharge of air and fuel into the firebox being accomplished by the use of a combined pulverizer, blower and steam turbine located on the locomotive. However, in this case the cylinder exhaust was not used to produce boiler draft, the coal dust was relatively coarse and no provision was made for precipitating and cooling the furnace slag, all of which no doubt contributed to the disuse of the equipment. The Swedish government railways have also done some experimental work in the burning of peat and coal powder in small steam locomotive boilers during the past few years, the fuel being prepared before supplying to the locomotive tender. In this case the powder is blown into the furnace by steam, and the firebox brick work is very complicated.

The first steam railway locomotive of any considerable size to be fitted up in the United States or Canada and so far as is known, in the world, with a successful self-con-

NAMES OF PARTS OF PULVERIZED FUEL EQUIPMENT

1. Enclosed fuel container.
2. Fuel supply inlets and covers.
3. Fuel conveyor.
4. Fuel and pressure air feeder.
5. Fuel and pressure air commingler.
6. Fuel and pressure air outlet.
7. Fuel and pressure air flexible conduit.
8. Fuel and pressure air nozzle.
9. Fuel and air mixer.
10. Firing up opening.
11. Induced air inlet damper.
12. Control for induced air inlet damper.
13. Pressure blower.
14. Steam turbine or motor for pressure blower.
15. Pressure blower manifold.
16. Pressure blower conduits.
17. Steam turbine or motor for fuel conveyor, feeder and commingler.
18. Control for steam turbine or motor for fuel conveyor, feeder and commingler.
19. Operating gear, shaft and clutches for fuel conveyor, feeder and commingler.
20. Switchboard (when electrical equipment is specified).
21. Brick arch.
22. Primary arch.
23. Auxiliary air inlets.
24. Combustion furnace.
25. Self-clearing air cooled slag pan.
26. Turbo-generator (when electrical equipment is specified).
27. Combination engine and turbo-generator exhaust nozzle and stack blower.

tained equipment for the burning of pulverized fuel in suspension, was a ten-wheel type on the New York Central. This locomotive has 22-in. by 26-in. cylinders, 69-in. diam. drivers, 200 lb. boiler pressure, 55 sq. ft. grate area, 2,649 sq. ft. heating surface, and has a tractive effort of 31,000 lb. It is equipped with a Schmidt superheater and Walschaert valve gear and was first converted into a pulverized fuel burner during the early part of 1914. Since the development of that application another similar installation has been made to a Chicago & North Western existing Atlantic type locomotive, and also to a new Consolidation type locomotive recently built for the Delaware & Hudson at the Schenectady works of the American Locomotive Company. This locomotive is probably the largest of its type in the world, as it has 63 in. drivers and about 63,000 lb. tractive effort, having been designed for combination fast and tonnage freight service.

This development has now passed the experimental stage, and arrangements have been made for proceeding with commercial applications as rapidly as the equipment can be produced. The general features of the equipment are shown in

the illustrations and the method of introducing the fuel and air into the firebox will be understood from a study of the names of the parts and the reference numbers on the sectional view of the equipment.

In the development of this apparatus the purpose has been to produce an equipment that will be readily applicable to either new or existing steam locomotives of standard designs; to standardize the various details and make them interchangeable for the different types and sizes of locomotives; to eliminate complicated mechanism for conveying fuel from the tender to the engine, and remove all special apparatus except fuel and air supply control levers, from the cab, and to insure positive control over the fuel feed, in order to quickly meet all conditions of road or terminal operation, and to provide for quick firing up. The entire regulation of combustion is effected through three hand control levers in the cab, i. e., fuel feed, air supply, and induced draft, the latter for use when the locomotive is not using steam. A refractory furnace is provided and so arranged that it insures ready accessibility to all parts of the firebox for inspection and maintenance. The fuel is carried in an enclosed container to insure a supply of dry fuel under all conditions of weather. The burning and storage equipment is designed to be readily convertible for the use of fuel oil.

In the application of the equipment to existing types of steam locomotives the diaphragm, table and deflector plates, nettings, hand holes and cinder hoppers are removed from the smoke box and the exhaust nozzle opening is enlarged. The grates, ashpan, fire doors and operating gear are removed from the firebox, and a fire-brick lined firepan, slagpan and primary arch, together with the fuel and air mixers and nozzles, are installed. The usual arch tubes and brick arch are utilized. In the cab the fire door is replaced with a furnace and the fuel and air supply regulating levers are installed. The tender equipment includes the enclosed fuel container and the apparatus for feeding, mixing and discharging the fuel and air, together with the steam turbine or motor operating mechanism. The engine and tender connections consist of one or more hose which connect the fuel and pressure air outlets on the tender to the nozzles on the engine. Flexible metallic conduits are used to convey the fan and fuel feeding motive power.

For firing up a locomotive the usual steam blower is turned on in the stack, a piece of lighted waste is then entered through the firebox door opening and placed on the furnace floor, just ahead of the primary arch, after which the pressure fan and one of the fuel and pressure air feeders are started. From 45 to 60 minutes is ordinarily sufficient to get up 200 lb. steam pressure from boiler water at 40 deg. Fahrenheit.

The prepared fuel, having been supplied to the enclosed fuel tank, gravitates to the conveyor screws, which carry it to the fuel pressure air feeders, where it is thoroughly commingled with and carried by the pressure air through the connecting hose to the fuel and pressure air nozzles and blown into the fuel and air mixers. Additional induced air is supplied in the fuel and air mixers, and this mixture, now in combustible form, is induced into the furnace by the smoke-box draft. The flame produced at the time the combustible mixture enters the furnace obtains its average maximum temperature, from 2,500 to 2,900 deg. F., at the forward combustion zone under the main arch, and at this point auxiliary air is induced by the smoke box draft to finally complete the combustion process. The uniformity with which locomotives can be fired, is indicated by the fact that the regularly assigned firemen can maintain the steam within a variation of two pounds of the maximum allowable pressure, without popping off. As each of the fuel and pressure air feeders have a range in capacity of from 500 to 4,000 lb. of pulverized fuel per hour, and as from one to five of these may easily be applied to the ordinary locomotive tender, there is

no difficulty in meeting any desired boiler and superheater capacity.

The smokebox gas analysis will average between 13 and 14 per cent of CO₂, when coal is fired at the rate of 3,000 lb. per hour, between 14 and 15 per cent at the rate of 3,500 lb. per hour and between 15 and 16 per cent at the rate of 4,000 lb. per hour, so that as the rate of combustion increases, there is no falling off in the efficiency, as obtains when coarse coal is fired on grates. The waste of fuel from the stack, where coal having a large percentage of dust and slack is used; the lowering of the firebox temperature and draft, due to opening of the fire door; and the resultant variation in steaming and general results under high rates of burning fuel on grates, where all of the foregoing factors are involved, are eliminated.

The liquid ash runs down the underside of the main arch and the front and sides of the forward combustion zone of the furnace and is precipitated into the self-clearing slag-pan, where it accumulates and is air-cooled and solidified into a button of slag which can be dumped by opening the drop bottom doors.

As in the case of all mediums for producing mechanical power that are now used to bring about the most advanced and progressive results, such as naphtha, gasoline, kerosene, crude and fuel oils, compressed air, storage batteries and electricity, there is a certain element of danger in the use of pulverized fuel that does not obtain with the more ineffective coarse coal. However, there are now certain established rules and regulations governing the manufacture, storage, handling and use of pulverized fuel, which make it comparatively easy to avoid trouble, this being confirmed by the records of the industrial plant operations where ordinary care is exercised.

As in the case of electric locomotives, but little actual operating data is as yet available. The first complete installations of fuel drying and pulverizing plants and locomotive coaling stations, in combination with locomotives equipped for burning pulverized fuel, will be made by the Delaware and Hudson Company and the Missouri, Kansas and Texas, and these are not yet ready for operation. The locomotives so far equipped on other railways are still depending upon outside or inadequately equipped sources for their supply of pulverized fuel, which makes the handling somewhat difficult. However, in the locomotive operation to date, it has been definitely demonstrated by the results obtained in road passenger and freight service, that the facts and conclusions previously set forth are fully justified.

DISCUSSION

M. C. M. Hatch, Superintendent of Fuel Service, Delaware, Lackawanna & Western.—The railroad coal supply of this country now costs a great deal of money, and prices, as well as we may predict, will rise. We cannot, on grate equipped engines, use with satisfaction poorer grades of fuel than we now use. Our fuel charges are bound to go up unless some method other than that now general is developed. Pulverized fuel seems to offer the best solution, so far as can now be seen; oil is prohibitive in cost, except in a few parts of the country. In our mining districts are many thousands of tons of refuse, rejected as unsuitable for fuel but still containing much heat value. Endeavors to utilize this refuse in the form of briquettes have been made but with questionable results, at least in locomotive service. Pulverized fuel may prove an outlet for this waste material.

"Stand-by" losses of all kinds aggregate about 25 per cent of the total fuel consumed. If these can be reduced considerable savings will result. Engine divisions are restricted in length by the distance fires can be run satisfactorily. If we can lengthen them or increase the percentage of time during which an engine can be kept in actual service, our charges will be decreased. Flexibility in steam making should be

attained to meet all operating requirements. If we can have this our service will be improved. We are trying as best we may to meet these conditions, but there are, at present, limits beyond which we cannot go, and the use of pulverized fuel may prove to be the solution of these difficulties.

My experience with oil burning locomotives has shown that it is not practicable to run a much larger nozzle when using oil than with coal. It seems to me that the combustion of pulverized coal, in suspension, will approximate oil burning conditions, and yet I understand that the nozzle can be increased in area very greatly. I should like to have this explained.

Following are some extracts from a letter from a correspondent in Chicago, the engine referred to being the Atlantic type on the Chicago & North Western, which Mr. Muhlfeld mentioned: "Some time ago you wrote me inquiring about the Chicago & North Western pulverized fuel locomotive. I had a ride on it the other day and was very much impressed with its performance. The fireman seemed to have as good control of the boiler pressure as the engineman had of the speed.

"The engine is of the Atlantic type and had 3 in. safety valves. During the trying-out period these were increased to 3½ in. and then to 4 in., as neither the 3½-in. or the 3-in. valves could take care of the pressure. This engine is equipped with three burners, and on this run, which was a suburban run from Chicago to Waukegan, only two were used. The fireman controls the amount of fuel burned by means of a rheostat, which controls the speed of the screw conveyor which feeds the coal to the firebox. He would anticipate the engineer by 15 or 20 seconds in closing the throttle, reducing the fire to practically nothing, and by careful manipulation he did not permit the opening of the safety valves once during the trip. There was a layover of an hour and a half at Waukegan and the fire was put out entirely for about three-quarters of an hour. About a half-hour before leaving time the pressure had dropped to about 150 lb., and one burner was started, the fuel igniting from the heat of the arch and other brick work. The pressure was raised to 185 lb., the working point, in due season for starting. A very high temperature is obtained in the firebox which thoroughly consumes the coal while on the road. After the engine has stood awhile at the terminal a little smoke will be produced on starting, in as much as the temperature has not been raised sufficiently to insure immediate combustion, but the smoke is practically negligible and the practice may be considered smokeless.

"While it is desired to use the pulverized fuel with only two per cent moisture, I believe the engine that day was operating with coal having five or six per cent. That is another reason for producing a little smoke when the temperature of the firebox is not at the highest point. With the Illinois coal they find that a little honeycomb forms on the tube sheet and has to be removed at the end of each trip. This is done with a rod through a hole in the side of the firebox. With the Eastern coals I understand that this trouble is not experienced. On this trip the operation was entirely dustless in the cab, although I believe a little dust might be expected. From an operating standpoint the scheme seems to be a great success."

In closing the discussion Mr. Muhlfeld said that the average cost for briquetting coal is from 75c. to \$1 per ton and the average cost for pulverizing is 11c. per ton; the pulverized coal does not have the objectionable features as to combustion that briquettes do.

Considerable experimenting has been done to determine the best size of exhaust nozzle to use when burning pulverized fuel and while these experiments are not yet complete, it is probable that an increase in nozzle area of 25 per cent over that used in hand firing will prove to be the most advantageous.

The Delaware & Hudson engine, which is the one shown in the illustration, is to use pulverized fuel obtained from tailings which pass through a 3/32-in. mesh screen. They are easily dried and have a heat value of 12,000 B. t. u. per ton. It is not yet known what proportion of this quality of coal can be used. It is probable that there is no saving in total weight in the Delaware & Hudson locomotive but some of the weight is transferred to the tender.

Replying to questions, Mr. Muhlfeld said that the collection of slag on the back tube sheet is due to incorrect combustion conditions and that adjustments can be made to eliminate this. Experiments are now being made to determine the best combination of conditions to avoid this accumulation. The pulverizing of the coal for locomotive use is best done at the coaling stations, as it is not practicable to haul pulverized coal in any large quantities in cars and store it for future use.

FAIR DEALING WITH FREIGHT CLAIMS*

By R. Hudson Burr

Chairman of the Florida Railroad Commission.

One of the most vital questions today is that of the proper handling of freight claims; vital to the claimant because his money is involved, and to the carrier because it affects the attitude of the shipping public toward him. It seems to me that the question could be best solved by an attitude of frankness and fairness on the part of both the shipper and the carrier. The shipper should only strive to collect the actual amount of his loss, and the carrier should be willing to promptly settle all claims made on a fair basis.

There has arisen a pretty well fixed idea in the public mind that the carriers do not intend to pay any claims that they can get out of paying, and also an idea on the part of the claim agent that the shipper is trying to collect all he can, regardless of the facts in the case. Another and most annoying evil is delay. I have in mind a case where a simple overcharge claim was held by a carrier for seven months. There was actually an overcharge, and that fact could have been ascertained by any claim adjuster within ten minutes' time. Another evil is the practice of some claim agents of trying to "shave" loss and damage claims. They disclaim any liability at all, and then offer settlement on a 50 per cent basis. Settlements of this nature are frequently accepted by small shippers rather than take the matter to the courts. On the other hand, shippers have been known to make claims for damages for amounts greater than were actually sustained. It is doubtless this practice on the part of a few shippers that is to some extent responsible for the existing attitude on the part of some railways.

I would suggest the following rules to be observed by shippers in making claims for loss, damage or overcharge:

1. Make your claims promptly.
2. Make your claims on basis of the actual loss, and do not try to include in one claim damages that were sustained on some other shipment.
3. When you have made a claim on this basis, let the carrier understand that you expect and will insist that it be settled as first presented.

There is also an obligation resting on the carrier, and this obligation could best be met by observing the following:

1. Handle all claims promptly.
2. Surround them with as little red tape as possible.
3. Assume that the claimant is always right until you have proved to him, politely and courteously, that he is in error.
4. Try to impress upon your local agents that a shipper who presents a claim is not an enemy in disguise, but

a patron of your company, seeking to collect that which he thinks is due him.

5. Pay the claims of small shippers as promptly and as cheerfully as you do those of the big concerns, and when you pay a small shipper, do not try to impress him with the idea that you are doing him a favor. Instead, try to give him the impression that you are paying him what belongs to him, and that you are glad of the opportunity to do so.

In the various commercial centers there are claim collecting agencies who collect claims for a percentage of the amount collected. Some of these agencies are good, and some are not good. The bad ones, for example, will present claims and insist on payment when there is no basis whatever on which to make the claim. Claims have been presented to one carrier on a certain theory of tariff interpretation, and to another carrier on exactly the reverse theory, the main purpose being apparently to collect the money.

Every railroad man, whether he be a traffic man or whatever his position, who comes in contact with the public, should get it fixed hard and fast in his mind that frankness, promptness and courtesy are among the greatest assets of the company for which he works. On the other hand, the shipper, or those of you who represent the public or the shipper, should conduct yourselves in such a way in your dealings with the carriers as to inspire their confidence and respect by the same frankness, promptness and courtesy which you expect from them.

REDUCING LIVE STOCK CLAIMS ON THE SANTA FE

In its campaign for the reduction of claims of all kinds, the Santa Fe has made special progress in the reduction of those for live stock. This traffic is especially subject to claims, for they are presented not only for actual injury incurred in transit but also for delays in reaching the markets. The Santa Fe is one of the largest carriers of live stock, particularly into Kansas City. The following figures showing the amount of this traffic and the number of claims paid for the last six fiscal years, show the decrease in payments per car for the system from \$2.93 to \$1.11. These figures include payments for poultry as well as for cattle, hogs and sheep.

DECREASE IN TOTAL PAYMENTS

Fiscal Year	Live Stock Revenue	Number Cars	Live Stock Claims Paid	Average Payment Per Car
1910	\$3,905,785	94,792	\$278,035.56	\$2.93
1911	4,159,812	103,461	245,490.60	2.37
1912	3,777,798	97,155	189,993.52	1.95
1913	4,487,360	114,474	169,662.44	1.48
1914	4,265,393	108,482	137,503.34	1.27
1915	4,128,417	106,450	118,411.14	1.11

The largest proportion of the claims originate on the Gulf Lines, where many range cattle are handled. These cattle are usually driven in from the range to the railroad and are frequently loaded with little or no food or water for one or two days prior to shipment. They are therefore in a weakened physical condition before loading and are practically subject to injury and to sickness in transportation to a northern climate. The average payment for claims per car on the Gulf Lines is \$2.94, while on the Santa Fe proper it is \$0.63.

PROPORTION OF LIVE STOCK CLAIMS TO TOTAL CLAIMS

Fiscal Year	Per Cent Live Stock Revenue to Total Revenue	Per Cent Live Stock Revenue to Total Carload Revenue	Per Cent Live Stock Claim Payments to Live Stock Revenue	Per Cent Live Stock Claim Payments to Total Claim Payments
1910	5.5	6.0	7.1	24.4
1911	5.8	7.3	5.9	22.5
1912	5.3	6.7	5.0	20.2
1913	5.7	7.2	3.7	17.9
1914	5.8	7.3	3.0	17.4
1915	5.1	6.3	2.8	15.5

*From an address before the Jacksonville Traffic Club, Jacksonville, Fla., January 29.

Operation of Norfolk & Western's Electrified Line

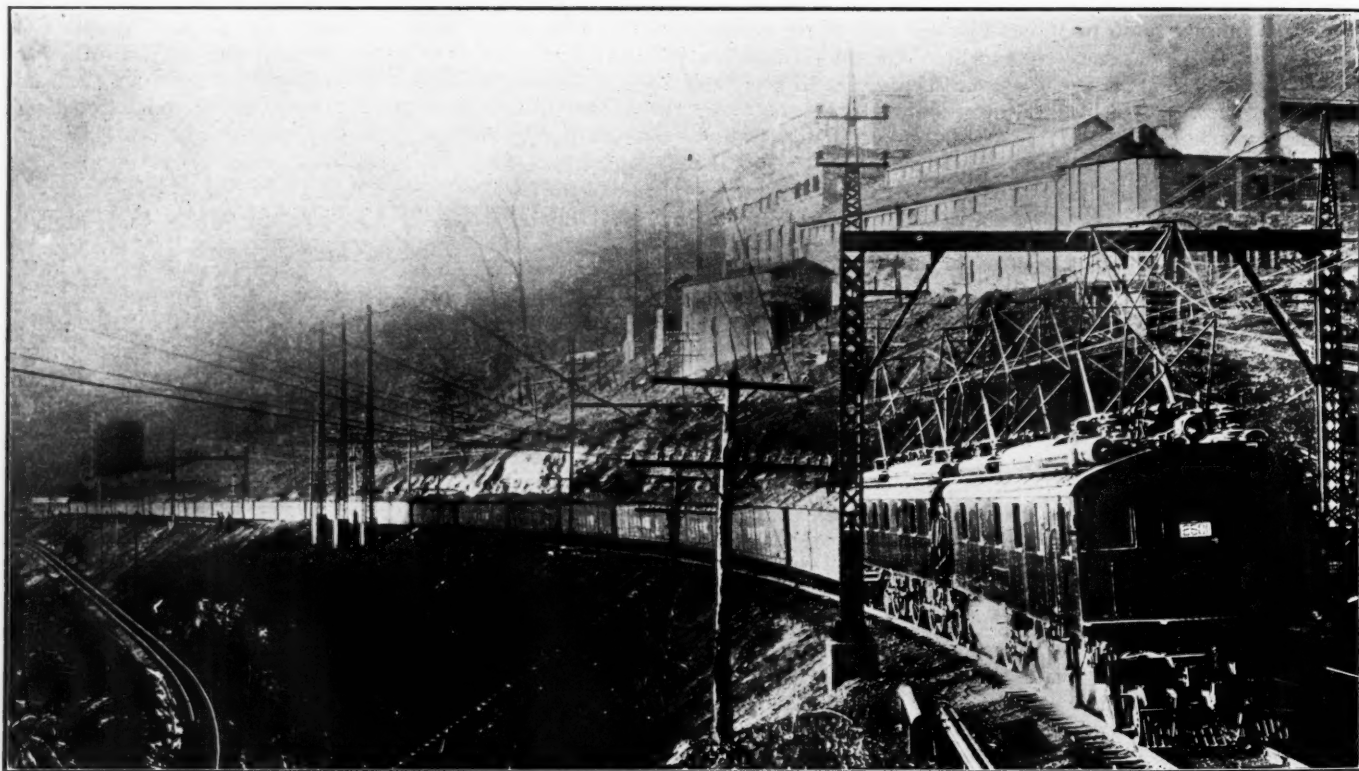
Description of Locomotive Inspection and Performance and Line Maintenance after Eight Months of Operation

A description of the electrified section of the Norfolk & Western, which includes about 100 miles of single track in the West Virginia coal fields, appeared in the *Railway Age Gazette* of June 4, 1915. The line has now been in operation over eight months. At this time complete data on the economy of the electric operation as compared with previous steam operation is not available but certain evident advantages of the new system are most interesting. Early in 1914 the average number of trains hauled by steam engines in both directions over the section under consideration was nine, each train weighing about 2,900 tons. This is equivalent to 26,100 tons per 24 hour day. Each train was hauled by from two to three Mallet compound locomotives, depending on the grade and a total of 20 such engines were required for this service.

At the present time the average eastbound traffic alone is about 35,000 tons per day, with 3,250 tons per train. This

at the west end of the line are at Eckman). Leaving the Bluefield inspection track, the locomotive goes to the West Bluefield yards, picks up a train of from 85 to 95 empties, and proceeding westward, sets them off at the various mines in the coal field west of the tunnel. Proceeding on to Eckman the locomotive, without turning, picks up what is known as a tonnage train of 3,250 tons, consisting of from 28 to 45 cars, depending on their capacity, and starts east. A pusher is used from Eckman to Ruth (at the eastern portal of the Elkhorn tunnel and at the summit of the two per cent grade). The single locomotive then takes the train to Flat Top yards where additional tonnage up to 4,750 is accepted. The run from Flat Top to Bluefield is made with the help of a pusher, on the three-mile $1\frac{1}{4}$ per cent grade at the end of the division, between Graham and Bluefield.

The round trip from Bluefield to Eckman and back is



A Full Tonnage Train Consisting of 25 180,000 lb. Capacity Coal Cars and Two Electric Locomotives

traffic is by 9 electric locomotives, as only 9 out of the 12 are in service at any one time.

The use of electric locomotives has had a marked effect on the operation of trains through the Elkhorn tunnel. The dispatcher will now allow a full tonnage train to leave Eckman Yards eastbound, ten minutes before a local passenger train is due, and will allow the same train to enter the tunnel four or five minutes ahead of a passenger train. Formerly, 20 minutes was the time figured on for a three-Mallet engine train through the tunnel, not only because its speed was less, but also because of frequent stalling. Two electric locomotives consistently pull a 3,250 ton train through the tunnel in about three minutes.

It will be of interest to follow an electric locomotive on one of its regular round trips over the line from Bluefield, W. Va., to East Vivian or Eckman and back. (The main yards

made in the average time of seven hours and two such trips constitute an average day's work for one train crew. Formerly with steam operation a day's work for one train crew consisted of a single round trip between Bluefield and the coal field, which usually took 12 hours. There are usually 9 of the 12 electric locomotives actually on the road, with one at Bluestone undergoing general repairs, one idle at Bluestone for relay and one over the inspection pit at Bluefield.

Some ammeter readings taken on one of these trips may be of interest. These readings were taken from the four ammeters in the cab, each meter registering the current taken by each of the four trucks. Normally the current taken by the different trucks is equal, therefore, the total current taken by the locomotive is four times the reading of one ammeter.

The train (westbound) consisted of one electric locomotive with a trailing load of 92 empties. When going up a 1.4 per

cent grade west of Bluestone at 14 m. p. h. the ammeter showed 500 amperes, and when coasting down the two per cent grade through and west of the Elkhorn tunnel an average regenerative current of 300 amperes was registered. Later, when coming east with 23, 75-ton cars (over half a normal tonnage train) with one locomotive, the ammeter showed 550 amperes on the two per cent up grade and a regenerative current of 400 amperes on the 2.36 per cent down grade. One locomotive will take a full tonnage train of 3,250 tons down the 2.36 per cent grade at about 15 m. p. h. without air brakes. Under such conditions, which are normal, the regenerative current per truck is about 550 amperes.

It is a most impressive sight to see one of these heavy coal trains hauled up one side of the mountain and lowered down the opposite side at a constant speed, without the use of air brakes and with no indications of the change in grade other than the gradual fall and rise of the ammeter needles. The regenerative ability of the three-phase motor is one of the main factors which makes their use for this severe service particularly successful. Another characteristic of the three-phase motor which has proved most valuable is its inherent ruggedness due to the absence of a commutator. When starting a heavy train on a grade with a steam locomotive the pusher does not shut off steam when the head engine stops the train with the air brakes. It simply holds against the train with open throttle, and in so doing permits the head engine to release the air and pick up its share of the slack when ready to start. When the front half of the train is under way the "pusher" will start its half, and the entire train will move with a minimum of jarring and bumping. Of course, poor track and weather conditions may complicate matters to such an extent that perhaps three or four minutes might be required to start.

The three-phase motors on the electric locomotives are peculiarly adapted to stand up under the severe conditions above mentioned when starting a heavy train. In fact their ability to stand still under full load for a maximum of five minutes while holding a train about to be started on a heavy grade, contributes in a large measure to their success in this installation.

LOCOMOTIVE MAINTENANCE

The facilities provided for the inspection and maintenance of the electric locomotives appear small when compared with the extensive and elaborate facilities required for the proper maintenance of an equal power in steam locomotives. One rather small machine and inspection shop at Bluestone and one small frame office and store building, and open air inspection pit and six sand boxes, at Bluefield are all the electric locomotive facilities provided. The absence of round-houses, coal docks, cinder pits, water tanks and large machine shops is particularly noticeable and impressive. The general inspections and heavier repairs are made in Bluestone, a point about 11.5 miles west of Bluefield, while the terminal inspections and light running repairs are made at Bluefield, the eastern terminus of the electric zone.

When considering the question of providing proper maintenance facilities for the entire installation it was decided that Bluestone was the logical site for the main locomotive inspection and maintenance building because of its central location as regards the electric zone, and because the power plant was to be located there, near the only available water supply. The line maintenance force is also located at Bluestone in a brick building, formerly used as a pumping station.

The concentration of the various electric traction departments and the power supply at one central point results in co-operation and an organization efficiency. The power director, who is located at the power house switchboard, is at the center of a web of telephone wires connecting him with the train despatcher, division superintendent, signal bridges, yardmas-

ters, line patrol telephones, line foremen, locomotive inspectors, etc., and in this way he acts as the final bond between all departments, thus completing a perfect operating and maintenance organization.

LOCOMOTIVE INSPECTION

The general inspection routine requires under normal conditions, that one locomotive be sent to the shop each day. Rotating the 12 locomotives, one after another, in this way insures that each one receives a general inspection every 12 days. Of course extra heavy repairs upset this plan, but as a general thing it is closely followed. Immediately after a locomotive arrives in the shop it is given an inspection card. As will be noted, this card gives a complete list of the locomotive parts to be inspected. Each man in the inspection force is permanently assigned to cover a certain number of these items, the total being divided between seven wiremen, one airbrake

Form M. P. 392-E.

Norfolk & Western Railway Company
INSPECTION CARD
ELECTRIC LOCOMOTIVES.

LOCOMOTIVE No. _____ CAB No. _____

ITEM	NAME
1	PANTAGRAPHS & GROUND SWITCHES
2	BELL & CORD
3	HEADLIGHTS
4	ROOF WIRING
5	OIL CIRCUIT BREAKER
6	MAIN TRANSFORMER
7	PHASE CONVERTER
8	PHASE CONVERTER AIR GAP, BOTTOM
9	STARTING MOTOR
10	COMPRESSOR
11	FAN
12	MAIN KNIFE SWITCH
13	SWITCH GROUPS
14	REVERSERS
15	POLE CHANGEOVER SWITCHES
16	CONTROL CHANGEOVER SWITCHES
17	RHEOSTATS
18	MAIN MOTORS
19	MAIN MOTOR AIR GAP, BOTT. 1 2 3 4
20	MAIN MOTOR AIR GAP, SIDES, 1 2 3 4
21	MAIN MOTORS BLOWN OUT
22	GEARS & PINIONS
23	MOTOR-GENERATOR
24	RELAYS
25	METERS
26	COMPENSATORS
27	CONTROL & LIGHTING TRANSFORMER
28	LIGHTING CIRCUITS
29	REACTANCE COIL
30	WIRING
31	MASTER CONTROLLER
32	AUXILIARY CONTROLLER
33	BATTERIES
34	HEATERS
35	FLANGE OILER
36	HAND PUMPS
37	WATER PUMPS
38	SANDERS
39	AIR BRAKES
40	CONTROL AIR SYSTEM
41	CAB
42	CAB BLOWN OUT
43	TRUCKS
44	DRAFT GEAR
45	JACK SHAFTS
46	JACK SHAFT OIL CUPS
47	T. L. JUMPER
48	OIL & GREASE
49	TOOLS & EQUIPMENT
50	
51	

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Inspection Card Used in Connection with the General Inspection of Electric Locomotives at Bluestone

man, one machinist and one pipefitter. In this way the work for each man is automatically outlined in advance and no time is wasted giving routine instructions. When the card is hung on the locomotive the force of inspectors start to work and as the inspection of each item is completed the man responsible marks his initials after it in the column headed "name." Any fault found is immediately reported to the foreman inspector who takes steps to have it corrected.

As each electric locomotive is made up of two distinct units or halves it is possible to take one half of one locomotive and attach it to a half of another locomotive. In other words these units or halves are interchangeable. This arrangement

has proved most convenient because it often happens that two locomotives require repairs to only one of these units at the same time. By the simple expedient of coupling the two good halves together, one good locomotive is made from two which would otherwise be unfit for service. Such a practice necessarily requires some special system for keeping the locomotive numbers straight. The system used is to give permanent distinctive numbers to the cabs (as the units are called) and temporary numbers to the entire locomotive of two cabs. The cab numbers are on a brass plate riveted to each end of the cab on the inside and consist of the letter E and a number. The locomotive numbers are on removable plates hung on the outside of each cab. A record is kept showing the cab numbers assigned to each locomotive number, and each time a change is made, copies of the corrected list are sent to the officers interested.

The maintenance facilities at Bluefield, where terminal inspections and light running repairs only are made, consist of a small frame building containing an office, an oil room, a locker and wash room and a store room. An open air inspection pit and six elevated sand boxes are also provided.

N. & W. ELECT'N. NOS. OF CABS—ELEC. LOCOS.		
LOCO. NO.	EAST CAB.	WEST CAB.
2500	E—.....	E—.....
2501	E—.....	E—.....
2502	E—.....	E—.....
2503	E—.....	E—.....
2504	E—.....	E—.....
2505	E—.....	E—.....
2506	E—.....	E—.....
2507	E—.....	E—.....
2508	E—.....	E—.....
2509	E—.....	E—.....
2510	E—.....	E—.....
2511	E—.....	E—.....

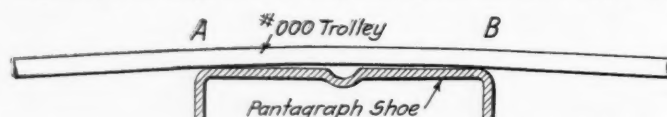
Gen'l Foreman Elect'n.

The Form Used to Keep a Record of the Cab Numbers Assigned to Each Locomotive Number

The day inspection and maintenance force at Bluefield consists of an inspector, a clerk, a wireman, a machinist, a pipefitter, an oiler, and three laborers. The night force consists of a machinist, a pipefitter, an oiler, and two laborers. Except for the electric light wiring, no inspection is made of the electric apparatus at night. The locomotives are expected to be ready for service after a layover of 40 minutes at Bluefield, except in cases, requiring extraordinary repairs. This means that a locomotive is laying over for inspection only about two hours out of every 24 or about 8 per cent of the time.

LOCOMOTIVE PERFORMANCE

No tires have been replaced since electric operation was inaugurated in May, 1915. Any flat spots that have appeared



Sketch Showing How the Upward Thrust of the Pantograph Shoe Curves the Trolley Wire So That It Makes Contact with the Shoe at Points A and B Only, Thus Causing Greatest Wear at Those Points

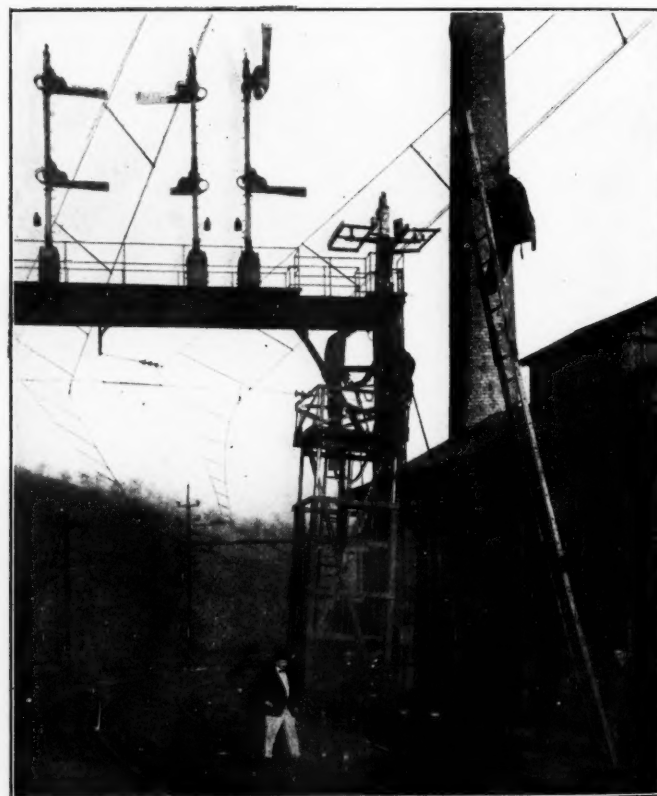
have been filled up by electric welding and then ground off to the proper contour.

The solution in the water rheostats (water and soda ash) is renewed about once a week. The renewable steel pan-

tagraph shoes have a serviceable life of from two to three months, the greatest wear taking place along the edges of the shoe. This is evidently because its contact surface is flat, whereas the trolley wire, at the point of contact, takes the form of a long radius arc due to the upward thrust of the pantograph. It is usually found that while the shoe wears through along the edge, the metal near the center is hardly touched.

LINE MAINTENANCE

The headquarters for the line inspection and maintenance force is located at Bluestone in a brick building formerly used as a pumping station. In addition to the office of the line foreman this building contains a storeroom for a complete supply of line material. The construction and maintenance facilities consist of a repair and construction train made up of a tower car, tool car and several flat cars for poles, wire reels, etc. The tool car is fitted with a grounded standard pantograph which is used as a safety ground as well as for



Line Inspection and Repair Outfit

gaging the height and position of the trolley wire. This construction train has been used but three times since last fall and then only for new construction work, involving trolley extension into branch lines or over additional side tracks, etc., and for trolley adjustment.

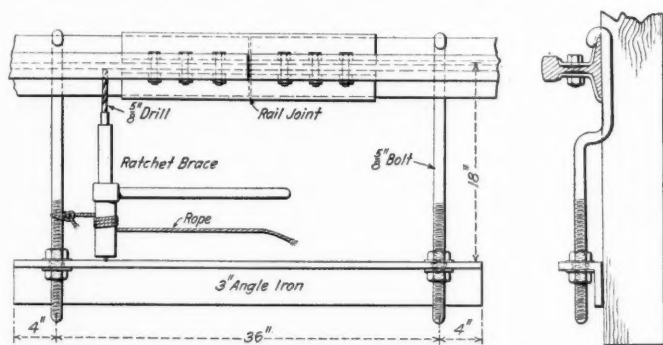
A small platform car and treated extension ladders are used for ordinary repairs. The tower on the platform car is telescoping, the upper half being raised to the proper height by two sets of pulley-blocks. This platform car is pulled behind an ordinary gasoline car. The outfit is very light and easily assembled, and may be quickly sent to any part of the line. It is manned by small gangs of not more than five men, consisting of four wiremen and a flagman. The maintenance of the entire line is taken care of by two such crews, one at Bluestone and one at Bluefield. The entire line is inspected daily by one man who generally rides the locomotives. Patrol telephones, in locked iron boxes, are located on each west signal bridge, which are about one mile apart. These telephones which connect with the power di-

rector at the power house are used by the maintenance crew and section foremen for reporting trouble, completion of repairs, etc. In addition each line crew has a portable telephone set which may be tapped on to the through telephone line between Gary and Bluefield.

All section foremen have been instructed to call up the power director when rails are to be removed so that arrangements can be made to have the line crew go out and take care of the bonding. Usually the section foreman carries a sufficient number of long jumpers which are bolted to the bonds on each side of the new rail. When such a jumper is used it is left connected until the bonding crew installs the permanent bonds later.

BOND-HOLE DRILLING OUTFIT

A device shown herewith is used by the line construction and maintenance force for drilling bond-holes in the rails. It consists essentially of an angle iron attached to the bottom of the rail by two threaded hook-bolts. This angle iron forms a back or "old man" for the hand ratchet brace as shown in the sketch and is long enough to allow the drilling of one hole on each side of the fish-plates. The rope, which is tied to one of the hook-bolts, is given a few turns around the hand feed on the brace and is used to hold the feeding device when



Apparatus for Drilling Bond Holes in the Rail

additional pressure is required on the drill point. The feeding device could be operated by hand but the rope is easier and less awkward to operate. A padded wooden seat used in connection with this outfit has a projection on its lower side at one end so that the seat is level when one end is placed on the rail and the other end on the ties.

This outfit is not only fast but is convenient for use on the main line where trains may be expected any time. When a train approaches it is simply necessary to take the seat off the track and throw the ratchet handle down parallel with the rail, an operation requiring but a few seconds and one that does not disturb the drill.

While in general the over head catenary system has been perfectly satisfactory in one or two isolated cases the suspension insulators have flashed over due to an accumulation of wet snow and soot, but trouble from this source is surprisingly infrequent. The wearing effect of the pantagraph shoe on the trolley wire is small. A piece of trolley wire which was removed from Elkhorn tunnel after eight months of continuous service showed a flat spot about 1-16 in. wide.

REGENERATION LOADING RHEOSTATS

Ordinarily the power regenerated by a train going down grade is absorbed by locomotives working at other points on the system. There are times, however, when the regenerative power is greater than the load and if no other load was provided the excess would reverse the power plant generators and run them as motors. To prevent this, a loading rheostat was originally installed, consisting of electrodes immersed in the intake canal. This rheostat was connected to the power plant busses by automatically operated oil switches controlled by reverse current relays.

Recently a new and improved type of regenerative loading rheostat has been installed. There are two separate rheostats each made up of three 15-ft. boxes, 2-ft. square in section and resting on 44,000 pin insulators. The three boxes, which are 4 ft. between centers, are connected in parallel. Fresh water is fed in at one end of each box through 3-in. Orangeburg fiber conduit which rests on 11,000 volt pin insulators. The water flows out through numerous holes in the opposite end. The holes near the bottom where the pressure is greatest, are smaller than those above, and in this way the water is made to move with a uniform velocity through the entire section of the box. There are two electrodes in each box, consisting of 5-in. channel irons, 15-in. long. They are hung from suspension type insulators fastened to sections of iron pipe resting on a wooden frame work. The high tension electrodes are connected to the 11,000 volt leads from the power-house which pass overhead and which are dead ended on a pole by three unit suspension insulators. The grounded electrodes are connected to a ground plate.

Each rheostat (three boxes) is designed to carry 500 kw at 11,000 volts. The capacity is varied, when necessary, by shifting the electrodes horizontally. As the conductivity of the water changes with different seasons of the year it is necessary to provide for proper adjustment of these rheostats. The small cross section of the boxes in the new rheostats make such an adjustment possible. Two rheostat circuits were provided to take care of the variable excess regenerative current and to facilitate the cleaning or repairing of one without taking both out of service.

SOME OF THE ABSURDITIES OF THE STRAIGHT LINE METHOD OF DETERMINING DEPRECIATION

By Jenks B. Jenkins,

Valuation Engineer, Baltimore & Ohio and Cincinnati, Hamilton & Dayton

The straight-line method of determining depreciation appeals to many on account of its apparent simplicity. It is frequently stated that the method is "based on life tables, similar to insurance tables." In reality the method is not based on such tables, but on the known age of a piece of property and its known or assumed average life. For example, if it is known that the average life of ties is 8 years, it is assumed that ties 4 years old have exhausted 50 per cent, ties 6 years old 75 per cent and ties 8 years old 100 per cent of their service life. It is often found that among a lot of ties having an average life of 8 years that there will be a considerable sprinkling of ties 9 to 12 or even 13 years old. This fact should be sufficient in itself to preclude the use of the straight-line method. It has been humorously suggested that the life should be considered as beginning anew after 8 years and that a tie 9 years old would therefore be considered as having exhausted only $\frac{1}{8}$ of its life.

As a matter of fact, a table "similar to insurance tables" would show the life of ties to be something like the following:

Age of tie	Expectancy as to total life	Expectancy as to remaining life
0 year	8 years	8 years
1 year	8 years	7 years
2 years	8 years	6 years
3 years	8 years	5 years
4 years	8.10 years	4.10 years
5 years	8.32 years	3.32 years
6 years	8.68 years	2.68 years
7 years	9.12 years	2.12 years
8 years	9.64 years	1.64 years
9 years	10.26 years	1.26 years
10 years	11.11 years	1.11 years
11 years	11.56 years	0.56 years
12 years	12.29 years	0.29 years
13 years	13.0 years	0 years

The above includes in the average those ties which have just exhausted their life and which, it is assumed, have not been taken out of the track; if these are excluded, the life

expectancy of the remaining ties will be somewhat higher.

The advocates of the straight-line method claim that every other consideration is negligible than the fact that, the average life being 8 years, $\frac{1}{8}$ of the ties are replaced each year and therefore all the ties or their equivalents are replaced in 8 years, and that the average tie is only good for 4 years more and is therefore depreciated 50 per cent and only worth 50 per cent of the cost of reproduction new. The relation between either the cost or the service value of the 4-year-old tie and that of a new tie of different quality able to perform the same service for an equal length of time is completely ignored, as are all facts pertaining to the strength or other qualities of the tie as compared with that of a new one, or as compared with the qualities required for the character of traffic and the service performed.

Property deteriorates from many causes; in reality, it never deteriorates from age alone. Deterioration may be caused by decay, which is a disease which has a beginning and usually ends in the destruction of the property, but which may possibly be arrested and do no further damage; by the action of the elements, differing materially from year to year in the same location; from use, depending on the use to which it is subject, and from abuse, such as overloading or as a result of accident. Deterioration is usually progressive, though it may begin when the property is new but in other and exactly similar property it may not begin until after the property has been used for many years; there is often no means of forecasting when such deterioration may start.

Some classes of property do not deteriorate at all, but come to the end of their service life suddenly, as through breakage. Terra cotta pipe may be considered as coming under this class. New pipe is even more subject to breakage than old for the reason that the weaker sections break first and those that remain are the stronger and more durable. Ignoring, for the sake of illustration, differences in strength and assuming that 10 per cent of the pipe, new and old alike, break each year and that replacements of broken pipe are made at 12-month intervals, the average expectancy of life of each pipe will be 10 years, whether new or old, while the average age of the pipe will be as follows:

At end of—	Average age before replacements	Average age after replacements
1st year	1 year	1 × 0.9 = 0.90 year
2nd year	0.90 + 1 = 1.90 years	1.90 × 0.9 = 1.71 years
3rd year	1.71 + 1 = 2.71 years	2.71 × 0.9 = 2.44 years
4th year	2.44 + 1 = 3.44 years	3.44 × 0.9 = 3.10 years
5th year	3.10 + 1 = 4.10 years	4.10 × 0.9 = 3.67 years
etc., until ultimately....	9 + 1 = 10.00 years	10 × 0.9 = 9.00 years

instead of 5 and 4½ years respectively, as would appear from superficial consideration only.

Since the average service life of the pipe is 10 years and the average age of the remaining pipe, before the annual replacement, ultimately becomes 10 years also, it necessarily follows that, if the actual age of the pipe is used, the straight-line method as ordinarily applied would give a depreciation of 100 per cent for pipe in perfect condition, or an average depreciation of 90 per cent after the annual replacement. But as a matter of fact the pipe has no depreciation whatever and still has an expectancy of future life of 10 years, regardless of present age. But if we take into account the fact that the weaker pipes have been culled out through annual replacement, it necessarily follows that old pipe is stronger, more durable and of more value than new.

Herein is found a sharp distinction between "depreciation" in bookkeeping, more properly "depreciation allowance," and actual depreciation, or that deterioration which results in a lessening of value. The depreciation allowance in the above illustration should be 10 per cent per annum, to provide for renewal; of actual depreciation there is none, as it is the existing property which is inventoried, but an actual appreciation due to the higher average quality of the pipe.

The total accrued depreciation in property which has a

life of ten years may follow approximately any one of the following tendencies:

POSSIBLE DEPRECIATION TENDENCIES										
Total Accrued Depreciation at end of										
Year	1	2	3	4	5	6	7	8	9	10
(A).....	20%	35%	50%	65%	75%	85%	90%	95%	99%	100%
(B).....	1%	5%	10%	15%	25%	35%	50%	65%	80%	100%
(C).....	0%	0%	0%	0%	0%	20%	40%	60%	80%	100%
(D).....	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
(E).....	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
(F).....	0%	0%	0%	0%	0%	5%	15%	35%	65%	100%

All of the above are unusual; E (the straight-line) is probably the most unusual of all; while F is probably the least unusual; but all are practically non-existent in property being used for railroad purposes.

It usually happens, on railroads, that property depreciated more than 40 per cent becomes either unsafe or uneconomical to be further employed in transportation service and the usual course of depreciation of property having a life of 10 years will be found, by examination of the condition of the property and of the service it is performing, to be about along the lines of the following:

USUAL DEPRECIATION TENDENCIES ON RAILROADS											
Total Accrued Depreciation at end of											
Year	1	2	3	4	5	6	7	8	9	10 Before retirement	10 After retirement
(G)...	0%	0%	0%	0%	0%	0%	10%	20%	30%	40%	100% less
(H)...	0%	0%	0%	0%	0%	0%	0%	0%	10%	40%	scrap or salvage value
(I)...	0%	1%	3%	5%	10%	15%	20%	25%	30%	40%	
(J)...	0%	0%	0%	1%	2%	5%	10%	20%	30%	40%	

The last of these is perhaps the most usual; the depreciation starts with some abuse, perhaps a derailment, an accidental overload, a leaky rainspout or neglect of painting or a choked-up drain back of an abutment. In this case, the property probably had the same expectancy of life at the end of the third year, was in as good condition and was performing its service as safely and economically as when new, its value was 100 per cent of the value new and there was no depreciation.

In the case (J) it is probable that it would cost about 70 per cent of the cost of the original property to replace it with another property capable of performing the same functions as safely and economically as the original was performing it at the end of the ninth year, and the value of the property the year before retirement would be 70 per cent of the value new, or the value of the property as used and by virtue of such use. The depreciation of 30 per cent at the end of the ninth year would be the "actual existing depreciation of the plant as compared with the new one" as ascertained by inspection, and determined with reference to its actual physical condition and the service it is performing and not a hypothetical or conjectural depreciation obtained by rules and formulas.

The value of railroad property when retired is usually at least 60 per cent of the value new and would cost at least 60 per cent of the value new to replace it with other property capable of doing the same service. The depreciation is practically never 100 per cent before retirement, for the reason that it would usually be criminal to employ any property for transportation purposes which had depreciated more than 40 per cent. The property is replaced long before its value has reached nil for the reason that the very nature of the transportation business requires all property devoted to that purpose to be maintained in nearly perfect condition. Property could usually be used 100 to 500 per cent longer by decreasing the load or speed or otherwise changing the conditions of its use.

MILITARY RAILWAY PROGRESS IN EAST AFRICA.—Good progress is reported as being made with the branch line from Voi station, on the Uganda Railway. The line, which had been carried as far as Mbuyuni, beyond Maktav, has now reached Serengeti camp, which was taken by a British force on January 24.

Reducing Cost of Handling L. C. L. Freight*

Descriptions of Measures Which Have Been Applied Successfully for this Purpose at Different Points

A great deal of attention has been given to the problem of reducing the cost of handling l. c. l. freight at individual freight houses recently. The following papers received in the contest on The Handling of L. C. L. Freight, describe methods which have been worked out at different stations.

SOME IMPROVEMENTS ON THE SOUTHERN

By W. H. Gatchell

Superintendent of Agencies, Southern Railway

Our efforts have necessarily been directed along the lines of economy with a fixed determination to secure maximum results with a minimum expense. After giving much thought to the various affirmative loading methods we found that no one of the several schemes could be applied to all of our stations, so a modification was necessary to fit the various points. We also found at many of the points we were not in position to introduce successfully any one of the methods without some revision in our platform arrangement and feeling that our station forces were entitled to every convenience if we expected to secure efficiency, our first move was to put the warehouse floors, run-ways and platforms in shape with a view to securing accurate economic operation.

We found that neither efficiency nor economy could be secured by distributing freight over our heavy transfer platforms through car-door gangways. To overcome this, we devised a plan by which we could construct surface gangways from platform to platform between the cars. The old plan of crossing through cars necessitated spotting practically every car between platforms on 8 or 10 tracks, 18 car lengths long, this being the maximum length of our transfer sheds. Under this arrangement, we figure that from 60 to 80 per cent of the house or shed switching is cut out. Instead of spotting car doors between platforms the line of cars on each track is cut with an 8-ft. opening at the several points provided for the portable gang-ways.

Under the old plan of crossing through cars from platform to platform in order to make gang-ways we were forced to break the seals on a large percentage of the cars under load and set the freight found in the door-ways out on the platform before we were ready to check or handle the cars. Under the present method the seals are not broken until the cars are ready to be checked. The check clerk either breaks the seal personally or causes it to be broken under his supervision.

Under this operation personal injuries have been practically eliminated, damage to freight as a result of breaking gang-ways and trucking through cars has been done away with, lost motion from trucking in opposite directions through cars has been eliminated and the handling from one section of the shed to another over two or more platforms has been speeded up to a point that has resulted in a material reduction in our cost per ton.

These adjustable gang-ways are built in sections, resting on wooden horses, and are installed at 14 of our principal forwarding and transfer points. Coupled with this surface operation is a modified drop truck system that is really the basis of the affirmative record. Freight handled under this method keeps the truckers and stowmen on the move which of course means time and money. (We do not operate the no-gang system in connection with the drop truck plan.)

We should not deceive ourselves with the idea that all of the errors found in the outbound business are chargeable to

the platform operation. As a matter of fact "waybill failures" and other causes are responsible for more of these errors than the loading itself. Our investigations have developed that from 60 to 80 per cent of the irregularities result from errors in billing, failure to bill, miscarriage of billing, failure of local crews to properly unload at destination or error in checking at a break bulk point or destination.

To overcome waybill failure such as errors in billing, failure to bill or the erroneous forwarding of waybills, we have inaugurated a plan of checking the waybills back against the bills of lading, item by item; in addition to this, all of the heavier stations have been equipped with waybill racks with pigeon holes numbered according to the board numbers, running from Board No. 1 up to as many cars as are handled at a particular station. At the close of the day's work the waybills are distributed throughout this rack by board numbers, these numbers being shown in our billing just beneath the car number. In making this distribution the car number in which the freight is loaded is lost sight of temporarily. After the distribution has been completed each group of waybills is checked to see if all of the waybills for a particular car have been thrown together; and if the correct car number is shown in the billing the waybills are fastened together and pouched.

With improved loading methods and the precautions taken to see that the billing goes out in proper form, we have eliminated irregularities. For instance at Atlanta our errors in loading, waybill failures, etc., have been reduced 84 per cent during the past five months, at Chattanooga 76 per cent, at Memphis 86 per cent, at Spencer Transfer 65 per cent, at East St. Louis 92 per cent, at Inman Yards Transfer 81 per cent, at Louisville 47 per cent, and so on throughout the system.

As a further indication of efficiency growing out of these improved methods, I quote the percentage of decrease in over, short and damage reports for October, November, and December, 1914, and January, 1915, as compared with same period of the previous year:

	October Per Cent	November Per Cent	December Per Cent	January Per Cent
Over reports	42.03	48.34	57.41	58.48
Short reports	32.62	43.24	50.72	45.19
Damage reports	8.20	12.76	21.09	28.91

Our cost per ton, for example, at Inman Transfer, for several months shows an average of \$0.224 per ton as against \$0.264 for the same period last year, at Knoxville \$0.28 against \$0.36, at Louisville \$0.225 against \$0.228, at Spencer Transfer \$0.191 against \$0.193, at East St. Louis \$0.234 against \$0.296, etc.

After trying out various methods of unloading inbound freight with a view to an accurate economic delivery, the one that appeals to me as being the best from every point of view is what we term "Sectional Unloading" coupled with a "Tail-board Delivery."

The warehouse is divided into sections designated by numbers or letters. The entire contents of each car are unloaded and stowed in the most convenient warehouse section, each shipment being stacked by itself with all marks exposed. As the freight is run from the car the check or unloading clerk notes the section number or letter on the original waybill or a copy of the freight bill if he is checking by the latter record. The section into which the freight is unloaded is entered on the face of the freight bill as a location guide for the delivery clerk. As the freight is stacked on the truck to be sent from the car into the warehouse, the loader or caller

*The two prize winning papers received in this contest were published in the issue of November 26, page 1005. Five papers on the subject of "Starting Right in Handling L. C. L. Freight Traffic" were published in the issue of January 7, page 5.

stamps the car number, date and station on each piece of freight. This record serves to clear up any irregularity that might creep into the warehouse operation. Under this process little time is consumed in locating the freight covered by a particular freight bill for any consignee. The teamster drives to that particular warehouse location, the delivery clerk quickly locates the packages and the warehouse porters truck the shipment to the tail-board of his dray. If the cartman holds freight bills for two or more shipments in different warehouse locations, they are trucked to him in the same manner. We have found no delay to consignees' teams growing out of this method of delivery but, on the other hand, this method of warehousing and delivery has resulted in expediting the movement of teams. It will be understood from the foregoing that the consignee's drayman has little opportunity to go back of the bulk head into the warehouse. That is one of the most important factors in the safe operation of a freight shed—keep everybody out who is not connected with the company as far as it is possible to do so.

Under these methods we are securing results that are very satisfactory both from a freight handling standpoint and from the standpoint of expense. Our average cost of operation for the system is about 17.37c. per ton. We are protected under this plan of warehousing against errors in delivery growing out of an old method of assigning locations to individual consignees to which location all freight for a particular consignee is trucked from all cars unloaded during the day, thus bunching the entire business for one consignee in one location. The lots, or various shipments, naturally become mixed and frequently result in the delivery of parts of two or more shipments to cover a particular freight bill, to say nothing of miscellaneous damage as a result of moving the packages about to find a particular lot of freight. Broken packages as a result of this moving about offer opportunity for theft and waste, while the general mixing of various shipments for one consignee results in the disappearance of whole packages from the warehouse which it is difficult, if not impossible, to explain.

THE ECONOMY OF LARGER TRUCKING UNITS

By W. F. Hebard

Electric Truck Department, The Buda Company, Chicago.

Conditions in outbound houses and transfer stations are very similar; freight is received on one side of the house from teams or cars, and is checked, trucked to the proper point and placed in cars on the other side. In inbound houses, however, the freight is usually unloaded on the floor directly in front of the car, and the consignee receives it at the nearest door. Consequently, trucking distances are short, and trucking congestion and expense are not as serious as in outbound houses or transfer stations.

In all forms of transportation, whether by wheelbarrow, team, train or boat, the constant aim has been to increase the unit load. For some reason railroads in general have not recognized this principle in freight house operation, for practically no attempt has been made to increase the size of the trucking unit, and the same two-wheel hand truck that our grandfathers used in the first freight houses is still in almost universal use. In fact, archaeologists claim that two-wheel hand trucks were used in the construction of the pyramids.

The average load on a two-wheel truck is only 250 lb.; further, a large part of the trucker's strength is required merely to support the load and but a part of his efforts can be used in actual pushing of the truck. A type of truck which would carry a greater load and in using which the trucker could utilize all his strength in pushing, would be more efficient. The four-wheel platform truck meets these requirements, and, in the writer's view, is the ideal truck for

freight house use. A trucker can handle 1,000 lb. on one of these more quickly and easily than 250 lb. on a hand truck, or, in other words, four-wheel trucks increase the unit capacity three or four times. Package freight can be checked from the teams or cars directly on to four-wheel trucks, thus preventing the accumulation of "dead" freight at the team doors, and facilitating the quick unloading of teams. Where freight is unloaded from teams on the freight house floor, as is usually the case where two-wheel trucks are used, double handling is necessary.

The use of four-wheel trucks is a great improvement over the usual two-wheel hand trucks because it increases the trucker's capacity at practically no increase in expense. If his capacity can be still further increased, enabling him to move several four-wheel trucks at once, proportionate economy should be shown. One loaded four-wheel truck is about the limit that one man can handle at a time, but one man with an industrial motor truck can move ten or twelve. These motor trucks, used as power to haul loaded four-wheel trucks, have proved very successful in several cases and have shown marked economies, several trucks that are to go to adjacent cars being coupled together into a miniature train. The motor truck can couple on at a convenient time, haul them through the house and drop them opposite the proper cars, the stowers pushing them into the cars or carrying the freight in, as may be advisable. Automatic couplers have been devised to facilitate the handling of trailers, so that one man can handle a motor without assistance.

Motor trucks, handling freight in much larger units and at higher speeds than hand truckers, necessarily require a clear gangway. A runway 10 or 12 ft. wide should be plainly marked on the floor for the entire length of the house and kept absolutely clear of freight or standing trucks, so that the motors will have a clear space to work in and will not be delayed, for to effect economy with a motor truck it must be kept in motion. If the motorman has to stop and inspect waiting trucks to determine where they go, or pick them up one at a time, a large part of his time is lost. Therefore, every effort should be made to have the spot numbers of the cars marked plainly on the packages, and to have the waiting trucks coupled up into trains in station order, so that the motor can couple on with the minimum delay.

Most l. c. l. shipments are below 1,000 lb. in weight, and if but one shipment were placed on each trailer truck, most of them would be lightly loaded and their efficiency much curtailed. This is particularly true of shipments consisting of one or two small packages only. Several of these for cars in one section of the house can be loaded onto a "peddler truck," hauled by the motor to that section and then "peddled out" to the different cars by hand. In many cases, also, two shipments for the same car or run, can be placed on one truck, thus making the large size four-wheel trucks and the motors available for handling practically all the freight.

Where the motor truck is used to haul only, and is not loaded itself, and care is taken in making up its trains, excellent results can be obtained. The freight is moved to the cars more rapidly than under the hand-trucking system, which decreases the amount of freight in the house at any one time, relieves congestion, and makes more space available. In some houses, one man with a motor truck handles 10 to 20 times as much freight per trip as a man with a hand truck, at about twice the speed, and at a cost per hour but slightly greater. The writer has in mind one freight house where the use of motor trucks has decreased the trucking cost five cents per ton, or 12 per cent. At this house some 800 tons are handled daily with a saving due to motor trucks of \$40 a day. The possibilities of economies in freight house operation through the use of motor trucks in conjunction with four-wheel trailers are large and should receive serious consideration from railroad officials.

ANALYZING THE PROBLEM

By M. R. Sutherland,
Cleveland, Ohio

The freight station of the Baltimore and Ohio in Cleveland, is approximately 700 ft. long and 40 ft. wide, divided into three sections. The amount of freight handled daily in times of normal business varies from 400 to 700 tons.

When this freight terminal first came to my notice the following mode of operation was in vogue: The two end rooms constituted the inbound house, the freight being placed in alphabetical order that, from A to K in room 1, and that from L to Z in room 2. The center room served as the outbound house. No freight was loaded before the noon hour. There was no special arrangement of cars in the morning track set. Trap cars and road loads were placed as they

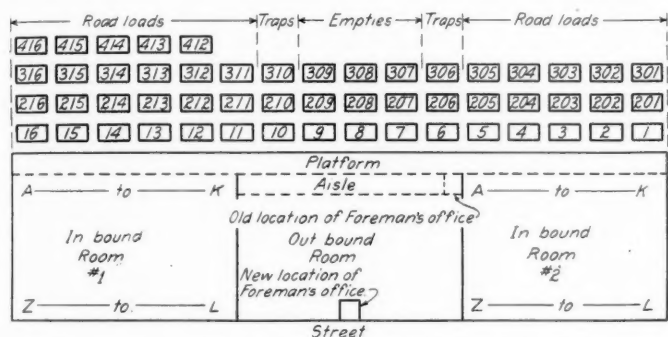


Fig. 1. Plan of Cleveland Freight House and Car Arrangement.

happened to come and no empty cars were set before noon.

All empties used were the result of the morning unloading. Consignments for "A" received in cars 1, 201 or 301 were trucked the entire length of the platform as were consignments for "Z" received in cars 16, 216, 316 or 416. During the noon hour the tracks were reswitched and as far as possible cars were placed in the position to be occupied by them in outbound trains.

In unloading trap or ferry cars in the morning, shipments were placed just inside the door of the freight house nearest to the position of the outbound cars to be set in the noon hour. For example a shipment for Wheeling received in a trap car was placed just inside the door near car 2 and marked with a slip showing that number. Needless to say the placing of outbound shipments in an inbound room, even temporarily, caused some confusion. Unloading continued until about 3 o'clock in the afternoon, at which time all gangs were put into the outbound house with resulting confusion.

Before trying to remedy or improve the existing condition it was considered necessary to learn the peculiarities of the terminal which more or less affected its operation. Examination showed that a large part of the freight received for shipment in the forenoon usually came from the same shipping houses, and was consigned in a general way to the same localities. The same thing proved to be more or less true of the contents of the trap cars. Under the old arrangement all freight except part of that received after 4 o'clock was re-handled in moving from the tail-board of the wagons to cars.

The first suggestion carried out was the placing in the morning of nine empties opposite the outbound house as shown in Fig. 1. Three trap cars were placed on each side to the nine empties. If more than six trap cars were received they were placed next in line. All freight received in the early morning for any one of the nine cars was taken directly from the dray to the car. All other freight received was placed on large flat trucks (marked with the destination and future car position) and finally checked for loading as

soon as a car was available. Contents of trap cars were likewise disposed of. As the morning wore on other empties were available for outbound use which resulted in keeping the outbound room practically clean in the forenoon. Trucks were taken to the outbound cars by the receiving force, whose time was usually far from being totally utilized in the morning.

The next move was to create two inbound houses. Each of the end rooms was made complete as shown in the diagram. This reduced the average inbound haul by more than 50 per cent. The maximum inbound haul (round trip), which was 1,380 ft., was reduced to 460 ft. or about $\frac{1}{3}$ of the former haul. Other changes, such as maintaining an aisle along the inside of the outbound room to facilitate the passing of bulky freight, helped to reduce the handling cost.

In order to study the results of these changes analysis curves were made of all conditions affecting the cost of handling. Weekly curves showing the relation between the cost and tonnage for each day were first plotted, which showed that, generally speaking, the cost varied directly with the tonnage. When, however, one considers that the overhead charges vary as a curve, it must be expected that the total cost will tend to do likewise.

The most interesting curve of all was that, showing the cost as a function of the tonnage for a period of four months. The curve for any month was gotten by drawing a line through the center of gravity of the points for that month.

From curves showing the relative flow of freight, it soon became apparent that the quantity was extremely variable. As it was impracticable to lay off men when the inbound tonnage was known to be light, and expect these men to come back the next day, the measures for reducing the cost of handling resolved themselves into two main factors. One, the determination of the minimum number of men required to handle the maximum tonnage, and two, ability to complete

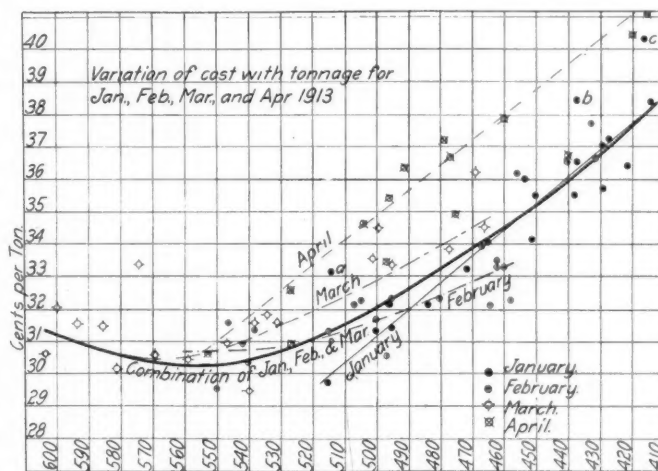


Fig. 2. Curve of Cost Analysis.

the day's work in a shorter time when anything under the maximum tonnage was handled. When the tonnage is light there is a tendency for truckers not on a tonnage basis to hold back, and it takes very close supervision to overcome this. For a light day of about 420 tons the cost per ton was increased by 2.6c. per ton for every hour the freight house was kept running after 5:30 in the afternoon. A study of the January curve in the diagram will show dots a, b and c as examples. The position of dot a was due to an hour and a half lost in making the noon switch (a switch engine off the track). The position of b and c was caused by extremely cold days with snow, which delayed everything in general. A study of the February and March curves shows that after a certain tonnage is reached the cost curve begins to rise again. Combining the January, February and March curves, it is

seen that the lowest cost was reached with about 550 tons. This was the economic capacity of the terminal under the existing system of freight handling. After this point was reached the houses became overcrowded and the force demoralized.

The April curve is shown in extreme contrast to that of the three former months. The cause is easily explained. It was the first opening of the freight house after the big March (1913) flood. The force was completely demoralized and allowed to do almost entirely as it pleased. Everyone seemed to think that he had no time for system and that under the circumstances he would not be censured for high cost.

This discussion is intended wholly to emphasize one point, which is that much can be accomplished by close supervision and keeping ones fingers on the pulse at all times. In closing, I take the liberty of quoting what I consider to be the best definition of "supervision" that has come to my notice. It appeared in an editorial of the *Railway Age Gazette* in the early part of 1913 and is as follows:

"Supervision, as we conceive it, consists in constant effort by competent officers to familiarize employees with the right ways to do things and constant checking to see that employees are doing things right. . . . Supervision is the very essence of the function of management. Instructions, training, drilling must be precedent to knowledge and obedience on the part of employees; and the management that does not do them the best that is possible is deficient, in proportion as it falls short of this idea."

SIMPLE MEASURES EFFECTED ECONOMIES

By J. W. Lawhead

Agent, Burr Oak Transfer, Chicago, Rock Island & Pacific, Chicago, Ill.

At Burr Oak transfer, Chicago, the C. R. I. & P. handles the through westbound merchandise from connections and the greater part of the trap car tonnage from Chicago shippers which is consigned via this line. We have two platforms, the larger, used for general transfer work, being 700 ft. long by 30 ft. wide, and the smaller, 250 ft. long by 25 ft. wide, used exclusively for the trap car tonnage from Sears-Roebuck & Co. and Montgomery Ward & Co., which class of tonnage is best handled by itself. On our main platform we have recently installed two steel runways 30 in. wide and 1/4 in. thick.

We work under the individual gang system. Each gang now consists of one checker, one caller or loader, and three truckers, a reduction from four truckers having been recently made since we have been using the steel runways, which greatly facilitated trucking over the platform. We have regularly assigned stevedores who are responsible for the loading of their cars. We have also recently added floating stevedores to assist in the loading work under the jurisdiction of the regular stevedores wherever required to prevent congestion.

We use four trucks with each crew. Thus the loader or caller has always an extra truck handy to load in advance of the return of the truckers who may be delayed in their unloading.

Since the recent revision of our freight handling organization our three-trucker crews have averaged 51 tons to the crew or 17 tons per trucker in not over nine hours per day for many weeks as against an average of 49 tons for the four-trucker crews previously used, or less than 13 tons per trucker. Our rate of errors has been reduced very materially through our reorganization of the working details, the establishment of penalties, etc. We charge checkers, callers, stevedores and truckers 25 cents for each error after they have made over 3 per month. This plan encourages the careful man and penalizes the careless one. However, we have not had to penalize a man in the last three months. Several men had no errors charged against them. Under our revised plan

effective on April 1, 1915, we have reduced our cost per ton \$0.026 on the net tons handled and on strictly a single tonnage basis, after giving the freight handling crews a better scale of wages.

THE WAR'S EFFECTS ON EUROPE'S RAILWAYS

By Walter S. Hiatt,

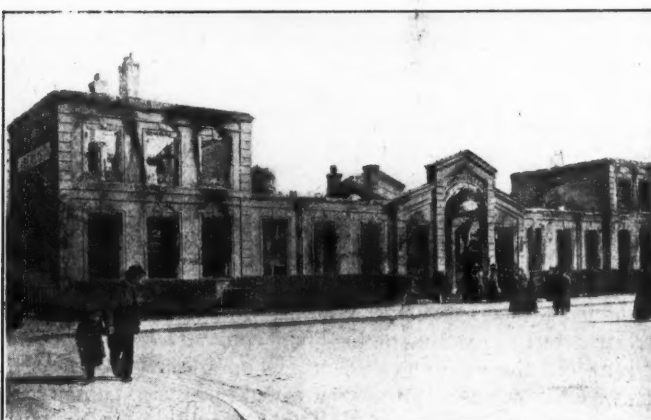
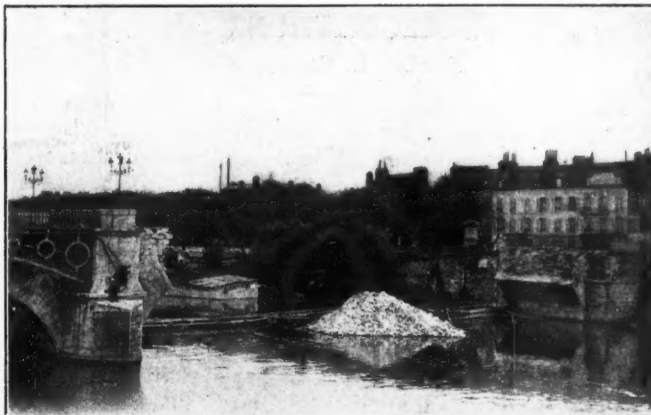
Our Special European Correspondent

On the opposite page are shown a number of views of French railway property destroyed by the contending armies. Artillery fire, however, is not the only agent which is assisting in the destruction or deterioration of the railways of the European continent. In war time not only is railway equipment used more extensively, but it is not kept in good repair. There is a spirit of waste and hurry, an idea of makeshift, and an inclination or a necessity to force material in need of repair to do work notwithstanding. These tendencies show themselves not only in the war zones but hundreds of miles behind the lines. Railway equipment in many cases is forced to do double or triple the service of normal times. There are fewer passenger trains for civil use now, for instance, than before the war, but each train is called upon to carry nearly the maximum train load. Indeed, it is not an unusual sight anywhere in Europe to see express trains so crowded that half the passengers must stand up for hours at a time. This war passenger traffic results not so much from the usual reasons as from the fact that whole families move about to visit their wounded in the hospitals, to escort their soldiers on their way to the front after a visit home or to meet them as they come home on leave. The crowding is rapidly deteriorating the passenger coaches. With fewer trains, also, the waits at stations are longer, the crowds greater and the wear and tear on the station's facilities much greater than usual. The uses of passenger and freight equipment for all kinds of military service are even more important as factors influencing the wear on railway property of all kinds.

At the same time, the railway authorities are unable to repair equipment properly or to make adequate replacements of property worn out or destroyed. Shop forces have been called for more important work and shops themselves turned over to the manufacture of munitions. The French in the past have been noted for the many years of service they get out of their engines. About a year ago some armored trains were prepared for use along the Yser. The French, rather than subject new equipment to the danger of destruction, took some locomotives 60 years old to haul the cars on which were mounted the 105 mm. guns. These locomotives had been used as yard engines for the past 12 years and before that had been in fast passenger service.

It must not be imagined, however, that the war will destroy the railways of Europe to such an extent that the manufacturers of railway equipment in the United States will be called upon to rebuild and re-equip them after the war is over. There will be a great deal of reconstruction to be done, no doubt, and American firms will be given a fine market for their goods. The best authorities express the opinion that, considering the normal depreciation and both the abnormal wear and destruction of railways through the war, the total depreciation will not total much over 20 per cent, even after two and one-half years of hostilities.

RAILWAYS IN THE CIVIL WAR.—During the course of the Civil War, the construction corps organized by the Federal authorities laid or relaid 641 miles of track and built or rebuilt 26 miles of bridges. The net expenditure for the transportation and construction incurred by the department in charge of railways totaled nearly \$30,000,000.



Destroyed French Railway Property in the War Zone

CONGRESSMEN'S VIEWS ON RAILWAY LEGISLATION

By W. L. Stoddard

WASHINGTON, Feb. 24.

The joint resolution for the creation of a joint congressional subcommittee to investigate the railroad question was this week the main subject before the House Committee on Interstate and Foreign Commerce. There is every prospect that there will be little difficulty in securing its early passage through the House, but the opposition to the whole scheme in the Senate presages possible trouble ahead later on. The most disputed item in the debate was the Borah amendment to include an investigation of government ownership. This, as reported last week, was adopted by a vote of 39 to 23 Senator Newlands himself voting nay. Those voting yea comprised the radicals and progressives of the Senate—such men as Kenyon of Iowa, La Follette of Wisconsin, Norris of Nebraska, Poindexter of Washington, Ashurst of Arizona, and Lane of Oregon. The nays comprised a typical assembly of "old guard" members—Bankhead of Alabama, Brandegee of Connecticut, Gallinger of New Hampshire, Smoot of Utah, and Weeks of Massachusetts. Senator Borah said that his amendment was not designed to unduly disturb the minds of those who are opposed to government ownership. "The amendment," said he, "is offered purely for educational purposes; for the purpose of ascertaining the facts with reference to a matter which some time or other I have no doubt we shall have to meet in this country." Before the vote on the Borah amendment, the Senator adopted an amendment defining in greater detail the duties of the joint committee, and another striking out the date on which the committee was to report, for which was substituted "as expeditiously as possible." An amendment by Senator Gallinger providing for the appointment, so far as practicable, of committee employees from the Civil Service list, was defeated on a roll-call by 21 to 40.

In the final vote, Wednesday afternoon, the thirteen senators who voted nay were all republicans, and included the leaders of that party in the Senate. Senator Smoot, speaking for the opposition, said that the railroads had been "investigated and investigated, and we have spent thousands and hundreds of thousands of dollars, and I do not care how much more they are investigated; nor do I think the railroads care. In fact, I rather think the railroads would like to have the investigation made"; but he objected to the investigation of telephone and telegraph companies, which would extend, no one knows where.

The Rayburn railroad securities bill is still the subject of hearings before the House Interstate Commerce Committee, with every indication of a favorable report and passage through the House. Pressure has been brought upon the opposition Senators and it is said that they are ready to allow a committee report and run the risk of open debate. The charge that the joint committee to investigate the railroad situation is being used to forestall all railroad legislation is an unpleasant one to meet, and as a consequence it is being largely dodged.

A conference is scheduled for today (Thursday) at the White House, at which the chief participants will be the heads of the four railroad brotherhoods, Messrs. Stone, Carter, Lee and Sheppard. It is given out that the conference is to take up matters connected with the Panama railroad, but most people assume that the eight-hour day demands will be discussed, also.

FURTHER RESTRICTIONS OF SCOTTISH RAILWAY SERVICE.—The Caledonian Railway on February 14 was compelled to make further restrictions in its passenger service. It is also announced that similar restrictions will be made by the North British Railway on March 1. The cause is the pressure of goods and mineral traffic.

TRAIN ACCIDENTS IN JANUARY¹

The following is a list of the most notable train accidents that occurred on railways of the United States in the month of January, 1916:

COLLISIONS					
Date.	Road.	Place.	Kind of Accident.	Kind of train.	Kil'd. Inj'd.
8.	Ches. & Ohio.....	Clyffeside	bc	P. & F.	0 7
23.	Chicago, B. & Q.....	Atlanta	bc	P. & F.	5 10
25.	Erie	Port Jervis	xc	P. & F.	0 2
DERAILMENTS					
Date.	Road.	Place.	Cause of Derailment.	Kind of train.	Kil'd. Inj'd.
2.	Southern	Barker's Creek	slide	P.	1 4
4.	Southern	English, Ind.	slide	P.	0 2
6.	Atlanta, B. & A.....	Tifton	unx	P.	0 0
7.	San P., L. A. & S. L.	Beryl	.....	P.	0 6
7.	M., Kansas & Tex.....	Rentiesville	b. truck	P.	0 0
9.	Southern	Madison, S. C.	unx	F.	0 0
9.	Grand Trunk	Island Pond	d. switch	P.	0 2
10.	Georgia	Swords	malice	F.	1 6
12.	St. Louis & S. F.....	Lela, Okla.	acc. obst.	F.	2 2
17.	Illinois C.....	Primghar	.....	P.	0 33
20.	Chicago, R. I. & P.....	Winston, Mo.	.....	P.	1 1
*25.	Kansas City So.....	Wilton, Ark.	exc. speed	F.	0 2
26.	Penn.	Valley Camp	slide	P.	0 7
27.	Penn.	Allenwood	acc. obst.	P.	1 1
27.	Penn.	Pataskala	acc. obst.	P.	0 1
28.	Carolina, C. & O.....	Kona, N. C.	slide	F.	1 1
29.	Sunset Central.....	Luling	.....	P.	1 2
31.	Sunset Central.....	Polvo	.....	P.	0 2
OTHER ACCIDENTS					
Date.	Road.	Place.	Cause of Accident.	Kind of train.	Kil'd. Inj'd.
5.	Penn.	Lawrence	acc. obst.	P.	1 2
16.	St. Louis & S. F.....	Sapulpa	boiler	P.	2 0
†22.	Great Northern	Corea	slide	P.	8 15

The trains in collision near Clyffeside, Ky., on the 8th were a westbound freight engine and eastbound passenger train No. 36. Two passengers and five trainmen were injured. There was dense fog at the time. The collision was due to an error of the despatcher, who authorized the westbound train to run on the eastbound track without first holding the passenger train.

The trains in collision near Atlanta, Neb., on the 23rd were westbound passenger No. 7 and an extra freight eastbound. Both trains were running at full speed and two engines and ten cars were wrecked. Five trainmen were killed and three passengers and seven employees were injured. The collision was due to forgetfulness on the part of the men in charge of the freight, who overlooked Train No. 7, which was on time.

The trains in collision at Port Jervis, N. Y., on the 25th were eastbound passenger No. 8, and a yard engine; the yard engine backing into the front of the passenger train west of the station. Two trainmen were injured, and 15 passengers were slightly injured by flying glass. The yard engine was occupying the main track without proper protection against No. 8, which was on time.

The train derailed near Barker's Creek, N. C., on the second was passenger No. 17, and the engine was overturned. The engineman was killed and two passengers and two trainmen were injured. The derailment was caused by a rock on the track, which had fallen down from a hill.

The train derailed near English, Ind., on the night of the fourth was eastbound passenger No. 23, and the engine and tender were overturned. The engineman and fireman were injured. The derailment was due to a landslide on a curve.

The train derailed near Tifton, Ga., on the night of the sixth was eastbound passenger No. 20; and one coach was partly overturned. No person was seriously injured. The cause of the derailment was not determined.

The train derailed near Beryl, Utah, on the seventh was westbound overland express No. 1. The train was running

¹Abbreviations and marks used in Accident List:
 re, Rear collision—bc, Butting collision—xc, Other collisions—b, Broken—d, Defective—unf, Unforeseen obstruction—unx, Unexplained—derail, Open derailing switch—ms, Misplaced switch—acc. obst., Accidental obstruction—malice, Malicious obstruction of track, etc.—boiler, Explosion of locomotive on road—fire, Cars burned while running—P. or Pass., Passenger train—F. or Ft., Freight train (including empty engines, work trains, etc.)—Asterisk, Wreck wholly or partly destroyed by fire—Dagger, One or more passengers killed.

about 35 miles an hour, and two baggage cars and one coach were overturned. Four passengers and two trainmen were injured. The cause of the derailment was not determined.

The train derailed near Rentiesville, Okla., on the seventh was the Texas Special Express and two cars were ditched; but no person was seriously injured. The train was running at about 50 miles an hour, but the cars were of steel and their bodies were not crushed. There were about 250 passengers on the train. It is believed that the derailment was due to a broken tender truck.

The train derailed near Madison, S. C., on the 9th was a northbound freight and five cars fell through the bridge over Tugalo River and the bridge was damaged so that the road was impassable for two days. The cause of the derailment was not determined.

The train derailed on the Grand Trunk near Island Pond, Vt., on the morning of the 9th was the southbound night express. Two men in the baggage car were slightly injured. The passengers all escaped serious injury, but suffered discomfort from very cold weather. The derailment was caused by a loose switch, loosened by the failure of a bolt.

The train derailed near Swords, Ga., on the tenth of January was westbound passenger No. 3 and the engine was overturned. The fireman was killed and the engineman, three passengers and two mail clerks were injured. The passenger cars were not derailed. The cause of the disaster was the malicious misplacement of a switch. The railroad company offered a reward of \$500 for the arrest of the perpetrators of the deed.

The train derailed near Lela, Okla., on the 12th was a westbound freight and the engine and five cars were wrecked. The fireman and a coal passer were killed and two other men were injured. The derailment was due to frozen ballast and ice in the flangeway at a highway crossing. A sleet storm had been followed by a temperature of 5 deg. below zero.

The train derailed near Primghar, Ia., on the 17th was a northbound passenger, and five cars were overturned. Thirty-one passengers and two trainmen were injured. The baggage car was the first to leave the rails and this, with two other cars, fell down a bank, and lodged in a creek.

The train derailed at Winston, Mo., on the 20th was the eastbound "Californian" Express. The second of the two locomotives drawing the train was overturned, as was the mail car also. One engineman was killed and one fireman injured.

The train derailed at Wilton, Ark., on the 25th was a southbound freight. Ten oil cars were thrown off the track and took fire; and their combustible parts were destroyed. Two trespassers were injured. The derailment was due to excessive speed on uneven track.

The train derailed at Valley Camp, Pa., on the night of the 26th was a northbound express. The engine was overturned and the engineman, fireman and five passengers were injured. The cause of the derailment was a large boulder which had fallen on the track.

The train derailed at Allenwood, N. J., on the 27th was a northbound express. It was running at high speed, and striking an automobile at a highway crossing, the engine and first car, which was an empty coach, were overturned. The engineman of the train and the two persons in the automobile were killed, and the fireman was injured.

The train derailed at Pataskala, Ohio, on the 27th, at 9:15 p. m., was westbound express No. 13. It struck an automobile at a highway crossing, and the engine and first five cars were derailed, but remained upright. The one man in the automobile was killed and a mail clerk was injured, but no other serious casualties are reported.

The train derailed near Kona, N. C., on the 28th was a northbound freight drawn by two engines. One engine and

five empty coal cars fell down a bank. One trainman was killed and one injured. The cause of the derailment was a rock which fell from the mountain side just as the leading engine was passing.

The train derailed near Luling, Tex., on the 29th was the eastbound Sunset Limited. The engine and baggage car were overturned. The engineman was killed and one baggage man and one porter were injured. Burning oil from the tender was spilled on some of the cars, but the coaches were of steel and no passengers were injured. The derailment was due to irregular track, caused by heavy rain.

The train derailed near Polvo, Tex., on the 31st was westbound express passenger No. 101. The first two cars were overturned. The conductor and one passenger were injured.

The passenger train involved in the wreck near Lawrence, N. J., on the fifth was westbound express No. 7. The engineman was fatally scalded and the fireman less severely hurt. The train ran into the wreckage caused by the derailment of a freight car in a train on an adjacent track, and the cab of the locomotive was demolished.

The train involved in the accident near Sapulpa, Okla., on the 16th was westbound passenger No. 9. The boiler of the locomotive exploded when the train was moving slowly on an ascending grade. The engineman and fireman were killed, their bodies being thrown, with the cab, some distance from the track; but the wheels were not derailed. The explosion was due to low water.

The train which was wrecked near Corea, Wash., on the 22nd was the westbound Cascade Limited. The train was struck by an avalanche while it was at rest, and one passenger car and one dining car were swept down the mountainside. Six passengers and two trainmen were killed and 15 passengers were injured.

Canada.—In a collision at Brandon, Man., on the 12th of January, between a freight train and a work train, 17 employees were killed. This accident was reported in the *Railway Age Gazette* January 21, page 134. In a collision of passenger trains at Moose Jaw, Saskatchewan, January 4, three persons were killed; and, as at Brandon, the survivors suffered severely from the cold. Those who worked to rescue the persons injured in the wreck sustained frozen hands and feet.

Electric Car Accidents.—Three accidents under this head reported in the newspapers as occurring on the railways of the United States in January, resulted in nine persons being killed and 36 injured. Near La Porte, Ind., on the fourth, a butting collision killed three; at Springfield, Ohio, a freight train ran into a street car, killing the same number, and a similar accident at Chicago on the 24th resulted in the same number of fatalities. On the elevated line of the Interborough Rapid Transit Company, New York City, on the 23rd, there was a spectacular collision on the double deck bridge over the Harlem river, when one train ran past a signal and into the side of another; but none of the large number of passengers were seriously injured. One car was partly overturned. Four passengers were taken to a hospital.

THE RAILWAYS OF THE KAMERUN.—Kamerun lies between British Nigeria and French Congo and extends from the coast northeastward to the southern shore of Lake Chad. The railways of the colony include the Northern Railway from Duala, the principal sea-port to Nkongsamba, 105 miles and the Central line from Duala to Edea, 56 miles. It has been proposed to extend the railway gradually from Duala as far north as Garua, nearly 550 miles inland on the Benue river, so that it would tap all of the northern interior; the Duala-Edea line also was to have been continued to Widi-menge on the Nyong River, about 130 miles beyond Edea. A railway from the port of Kampo, near the frontier of Spanish Rio Muni, into the hinterland has also been proposed.

General News Department

H. M. Brinkerhoff, a member of the engineering firm of Barclay, Parsons & Clapp, of New York City, has been appointed chief engineer of the Chicago traction and subway commission.

Edward Hungerford, advertising manager of Wells Fargo & Co., will address a meeting of the Railroad Y. M. C. A. of Chicago at a luncheon, at the Auditorium hotel today (February 25), on the subject, "The Human Side of the Express."

A. N. Martin, for several years past superintendent of the general office building of the Baltimore & Ohio at Baltimore, has in addition to his other duties been appointed supervisor of station service. He will have general charge of passenger stations and is responsible for the equipment, fixtures and the work of station forces. The supervision of station service will be extended to every agency through which the management of the railroad comes in contact with the public.

The United States Civil Service Commission, Washington, D. C., announces examinations in prominent cities all over the country, on March 22, for the position of junior civil engineer, grade 1, to fill vacancies under the division of valuation, Interstate Commerce Commission; salary from \$1,200 to \$1,680; age 21 to 36. Special weight will be given to experience in valuation and unit cost work. There will be similar examinations on the following day, March 23, for junior civil engineer, grade 2; salary \$720 to \$1,080.

The management of the Atchison, Topeka & Santa Fe has selected four recent graduates in woodworking from among the apprentices in the Topeka shops, and has arranged for them a special course of six months in the shops of the Pullman Company, where arrangements have been made to give the apprentices every opportunity possible to familiarize themselves with the Pullman Company's method of constructing cars. Some time ago the Santa Fe selected seven of its brightest machinist apprentice graduates for a similar special course at the plant of the Baldwin Locomotive Works.

Employees of the freight department of the Baltimore & Ohio at Pittsburgh, Pa., have organized a class for the study of their department of the railroad business. C. S. Roberts, chief rate clerk, is in charge of the course of instruction, assisted by Archibald Fries, general freight agent; T. J. Walters, division freight agent, and J. C. Kimes, commercial freight agent. The prescribed course will require eighteen months' study. The basis of rate-making, tariffs, inter-line participation in through rates, embargoes, per diem regulations, solicitation of traffic and industrial development will be studied.

The Missouri, Oklahoma & Gulf is having enclosed in various letters sent out by its different departments a small slip on which is printed the following: "As an employee of the Missouri, Oklahoma & Gulf my prosperity is dependent upon the success of that property. As a customer of yours your prosperity is, in a measure, contingent upon my success. Don't you think it good policy to do your share toward insuring the prosperity of your patrons in order that they in turn may do their share toward insuring yours? Ship your freight, buy your ticket and tell your friends to ship their freight and buy their tickets over the M. O. & G."

Thomas W. Hulme, general secretary of the Presidents' Conference Committee for the Federal Valuation of the Railroads, has issued a statement relative to paragraph five of the valuation act concerning the manner of reporting gifts or donations to the railways. He points out that while the valuation act clearly recognizes the fact that grants of land or right of way to a road, in consideration of certain acts to be done by the carrier, are not technically gifts or donations, nevertheless in order that the amount and value of such grants may be made known, it directs the commission to ascertain and report them and also to report the amount and value of any concessions made by the carrier in return therefor. This circular points

out in detail the various forms of aid which a railway may receive from the public or private individuals and the proper manner of reporting them in accordance with the provisions of the valuation law.

Representative Tinkham of Massachusetts has filed with the House judiciary committee a petition asking the impeachment of Judge George A. Carpenter, of the United States Court at Chicago, on a charge of improper practices in connection with the Chicago, Rock Island & Pacific receivership. Congressman Tinkham stated that he had filed the petition at the request of one of his constituents, Christopher F. Sweeney, of Boston. Mr. Sweeney's principal contention seems to be that Judge Carpenter appointed as receivers men who are friendly to the Moore-Reid group, and that the receiver is withholding the payment of interest on a debenture bond.

The Pennsylvania Railroad reports that its fire losses on the whole system last year amounted to only eight cents on each \$100 of property at risk. The total fire loss for the year was \$278,730, which was paid out of the road's own insurance fund. The value of the property exposed to fire hazard, and insured by the fund, is about \$350,000,000. Employees extinguished 441 fires, buildings, yards, etc., before the arrival of public fire companies. Organized fire brigades among the employees put out 84 of these fires, and locomotives equipped with fire fighting apparatus were used in putting out 40 fires. High pressure fire lines built by the railroad were used in six fires. Spontaneous combustion caused 15 fires, 36 started on adjacent property, and 12 were of incendiary origin. Lightning caused 2, boys 2, and tramps 11, while 130 were of unknown origin. Carelessness with tobacco and matches caused 12 fires which destroyed \$10,091 worth of property.

At a meeting of railway supply companies, held at the Hotel Sherman, Chicago, on February 7, a supply association was formed for the purpose of conducting exhibits in connection with the annual convention of the International Railway Fuel Association. A temporary constitution and by-laws were adopted to prepare for the coming convention, at which time the exhibitors will have an opportunity to perfect the organization. The following executive committee was chosen to act until the annual meeting: F. N. Bard, of the Barco Brass & Joint Company, president; C. W. Floyd Coffin, of the Franklin Railway Supply Company, secretary; W. G. Clark, of the Locomotive Stoker Company, treasurer; E. E. Barrett, the Roberts & Schaefer Company; Dr. Beebe, Buchanan Coal Company; G. E. Ryder, Locomotive Superheater Company; A. A. Taylor, Fairbanks Morse & Company; C. L. Brown, the Manning, Maxwell & Moore Company; and J. G. Crawford, secretary of the International Railway Fuel Association, honorary member. The annual convention and exhibit will be held at Hotel Sherman, Chicago, from May 15 to 18.

One of the Forty-Nine Masters

[From the Charleston (West Virginia) Mail.]

Two thousand tariffs, some of them containing 500 to 1,500 pages, and more than 5,000 supplemental tariffs, are filed with the West Virginia public service commission covering the rates of only five of the railroads operating in the state. Of this number the Baltimore & Ohio has 1,000 tariffs and 3,000 supplements; the Chesapeake & Ohio 571 tariffs and about 1,500 supplements; the Kanawha & Michigan 155 tariffs and 450 supplements; the Coal & Coke 178 tariffs and 550 supplements, and the Norfolk & Western 88 tariffs and about 270 supplements. These tariffs include the numerous commodity freight rates. Slight changes are being made in them every day, and not a mail comes in but it brings a tariff or supplement. Each of these must be gone over by the tariff clerk to check up the changes before it is filed. If an advance in a particular rate is discovered, as it frequently is, the railroad is asked to give a reason for

the advance. If this explanation is not satisfactory a day is set for a conference or hearing on the question involved.

Safety First Exhibition at Washington

As heretofore announced, the Department of the Interior, F. K. Lane secretary, is holding this week at the new National Museum at Washington (the Smithsonian Institution) a safety first exposition, prepared primarily for disseminating information about the work of the Bureau of Mines, but embracing also many exhibits from other departments of the government.

The exhibit of the Interstate Commerce Commission constitutes a prominent feature. It is designed to show the beneficial results of federal safety legislation.

There are three model cars fully equipped with all the safety appliances required by the commission's order of March 13, 1911; a small model locomotive boiler, arranged so that the interior can be seen, for the purpose of disclosing interior defects or the formation of scale; and a series of charts graphically illustrating the remarkable decrease in the number of casualties to railway employees since the passage of the federal safety appliance and boiler inspection acts.

A model block signal system is shown. The model is about 25 ft. long, and is in operation. The model has two sidings and is designed to illustrate single track operation. It is fully equipped with standard relays, d. c., and worked perfectly.

Failed material that had been the cause of train accidents investigated by the commission is shown. This includes rails broken because of transverse fissures, failed car wheels and failed bridge material. With these specimens there are shown a great number of test pieces that have been used in metallurgical studies. Model car couplers of many different types, and emergency knuckles and other parts used in making repairs are shown. More than 200 stereopticon views illustrating train accidents, which have been investigated by the Division of Safety and the Boiler Inspection Division, are shown on a screen.

Disastrous Collision at Milford, Conn.

In a rear collision of westbound passenger trains on the New York, New Haven & Hartford, two miles east of Milford, Conn., on the morning of February 22, about 11:21 o'clock, six passengers and four trainmen were killed and six employees and over 60 passengers were injured. The trains in collision were express passenger No. 79, which had been stopped because of the failure of an air brake hose, and local passenger No. 5. The local had left New Haven, about seven miles east of the point of collision, two minutes behind the express. Included in the killed are the engineman and the fireman of No. 5, a parlor car porter of No. 79 and the flagman of No. 79. The flagman, running back to signal No. 5, was run over by its engine; presumably while he was stooping to fasten a torpedo to the rail.

Three of the passengers killed were employees of the road, one a fireman and another a woman, a clerk in the general office at New Haven.

The rear car of No. 79 was a new steel coach. It is said that all of the killed were in this car. Many persons were injured in both trains. The engine of No. 5 and the rear car of No. 79 were thrown to the left and into a freight train moving in the same direction on the adjacent track (the passenger trains were on the outside or northernmost track); and the wreckage of the two passenger trains and of a part of the freight was scattered across the four main tracks. The boiler of the locomotive of No. 5 exploded and was detached from the frame and thrown over the freight train and across all four tracks to a point 50 ft. out in the field on the south side of the road. Eastbound passenger train No. 10, running at high speed, came on almost at the same moment that the collision occurred and was stopped but a short distance short of the obstruction on its track.

The rear end of train 79, when stopped, was about 300 ft. west of a block signal, and the next block signal in the rear, giving the caution indication, was about 2,000 ft. farther off.

Officers of the road reached the scene of the wreck from New Haven within 35 minutes after it happened.

As we go to press, the investigation to determine the cause of the collision had not proceeded far enough to give any detailed information. An officer of the road issued a statement from which, supplementing the foregoing paragraphs, we add:

"C. H. Morrison, signal engineer, and G. W. Chappell, his assistant, report that after the wreck the signals [automatic signals,

installed within the last year] were found to have been set properly. Mr. Chappell was on train 5, and immediately made an investigation; and was later joined by Mr. Morrison.

"The rear car of train No. 79 was one of the very latest and most modern steel cars. Investigation shows that the brakes on No. 5 were in proper working order.

"Engineer Curtis took charge of train 5 when it was made up at New Haven and had run about ten miles. The grade was slightly descending, about $\frac{1}{2}$ of 1 per cent.

"Flagman Tourtellette of train 79 has gone back about 700 feet from his train to warn No. 5, and was evidently killed as he stooped to place a torpedo on the track. Engineer Curtis had been an engineer on the road for seven years and had a very fine record. He was a clean living, upright man. Fireman McGinnis of train No. 5 had just passed his examinations to be an engineer, and was shortly to be promoted. He was also a good man in every particular."

Exhibits at the June Mechanical Conventions

The exhibit committee of the Railway Supply Manufacturers' Association held a meeting at the office of the association in the Oliver building, Pittsburgh, last Friday for the purpose of assigning space for exhibits, making arrangements for hotels, furniture, decorations, etc. As predicted in last week's issue, about 70,000 sq. ft. of space was assigned. Announcement was made that the association has also received a large number of inquiries concerning space, many of which will doubtless result in formal applications. Too much emphasis cannot be given to the request that those desiring exhibit space file their applications immediately. There is only about 8,000 sq. ft. of space remaining, considerable of which will be disposed of within a few days. The committee expects to issue circulars shortly concerning the arrangements for hotels, furniture, decorations, etc.

Air Brake Association

The twenty-third annual convention of the Air Brake Association will be held May 2-5, 1916, at the Hotel Ansley, Atlanta, Ga. The following subjects will be considered at the convention: Slack action in long passenger trains, its relation to triple valves of different types, and consequent results in the handling of passenger trains; proper piping of locomotives and cars, specifications and requirements for pipe in air brake work; adequate hand brakes in heavy passenger equipment cars; best method of educating apprentices to give the railroad companies efficient air brake mechanics; care of modern passenger brake equipment and factors contributing to the minimum cost of maintenance with the maximum efficiency; accumulation of moisture and its elimination from trains and yard testing plants; need of efficient cleaning and repairing of freight brakes, and recommended practice.

The Railway Business Association

By election of president, vice-president and treasurer at its recent annual meeting and by appointment of executive members by the president the official roster of the Railway Business Association for this year has been completed as follows:

President, George A. Post, New York; vice-presidents, W. H. Cottingham, Cleveland, Ohio; W. B. Leach, Boston, Mass.; E. B. Leigh, Chicago; Henry Elliott, East St. Louis, Ill.; J. S. Coffin, New York; Irving T. Hartz, Chicago; J. C. Bradley, Buffalo, N. Y.; treasurer, M. S. Clayton, New York; executive members—S. P. Bush, Columbus, Ohio; W. E. Clow, Chicago; Samuel M. Curwen, Philadelphia, Pa.; O. H. Cutler, New York; F. T. Heffelfinger, Minneapolis, Minn.; H. H. Hewitt, Buffalo; J. M. Hopkins, Chicago; Alba B. Johnson, Philadelphia, Pa.; A. M. Kittredge, Dayton, Ohio; Robert P. Lamont, Chicago; Frank J. Lanahan, Pittsburgh, Pa.; W. H. Marshall, New York; Stephen C. Mason, Pittsburgh; A. H. Mulliken, Chicago; Rudolph Ortmann, Chicago; W. G. Pearce, New York; H. G. Prout, Nutley, N. J.; S. F. Pryor, New York; W. W. Salmon, Rochester, N. Y.; G. W. Simmons, St. Louis; George T. Smith, Jersey City; James S. Stevenson, Detroit; H. H. Westinghouse, New York; W. W. Willits, Chicago.

The secretary, Frank W. Noxon, announces the creation of the position of executive assistant, and the appointment thereto of P. H. Middleton, who has served the association for the past three years.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, date of next or regular meetings, and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago. Next convention March 21-23, 1916, Chicago.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August. Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual meeting, 2d Thursday in March. Hotel Statler. Buffalo, N. Y.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 People's Gas Bldg., Chicago. Next convention, March 21-23, 1916, Chicago.

NEW ENGLAND RAILROAD CLUB.—W. F. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meetings, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York.
Regular meeting, 3d Friday in month, except June, July and August,
29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—M. W. Rotchford, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILROAD MEN'S IMPROVEMENT SOCIETY.—J. B. Curran, Erie R. R., 50 Church St., New York. Meetings, alternate Thursdays, October to May, Assembly Rooms of Merchants' Association, Woolworth Bldg., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August. Monongahela House, Pittsburgh.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Midyear meeting, March 20, Chicago. Next annual convention, September, 1916, Grand Hotel, Mackinac Island, Mich.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va.
Regular meetings, 2d Monday in month, except June, July and August.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga. Next meeting, April, 1916.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings. 1st Saturday in month, Boody House, Toledo.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAFFIC CLUB OF NEWARK.—Roy S. Bushy, Firemen's Bldg., Newark, N. J.
Regular meetings, 1st Monday in month, except July and August,
The Washington, 559 Broad St., Newark.

TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York.
Regular meetings, last Tuesday in month, except June, July and August. Waldorf-Astoria Hotel, New York.

TRAFFIC CLUB OF PITTSBURGH.—D. L. Wells, Gen'l Agt., Erie R. R., 1924
Oliver Bldg., Pittsburgh, Pa. Meetings, bi-monthly, Pittsburgh.

TRAFFIC CLUB OF ST. LOUIS.—A. F. Versen, Mercantile Library Bldg., St. Louis, Mo. Annual meeting in November. Noonday meetings, October to May.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave. Chicago. Next convention, June 21, 1916, Toronto, Ont.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R.,
East Buffalo, N. Y. Next meeting, September, 1916, Chicago.

UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August. Salt Lake City.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Building, Chicago.
Regular meetings, 3d Tuesday in month, except June, July and August, Grand Pacific Hotel, Chicago.

WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF DECEMBER, 1915.

Name of road.	Average mileage operated during period.	Operating revenues.			Operating expenses.				Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.	
		Freight.	Passenger.	Total.	Way and structures.	Maintenance of equip-ment.	Traffic.	Trans- portation.					Miscel- laneous.	General.	Total.
Delaware & Hudson Co.—R. R. Dept...	886	\$1,931,116	\$205,209	\$2,240,003	\$188,266	\$336,483	\$24,382	\$726,859	\$12,029	\$55,456	\$1,352,598	\$863,347	\$414,987
Union Pacific Railway	3,617	4,009,038	84,182	5,375,002	488,601	944,393	92,121	1,335,170	73,297	2,854,203	2,287,000	688,788	
Ulster & Delaware R. R. Co.	129	42,789	12,634	70,856	8,354	9,470	1,086	32,842	64	55,265	11,668	30,728	
SIX MONTHS OF FISCAL YEAR 1916													
Delaware & Hudson Co.—R. R. Dept...	886	\$10,625,999	\$1,622,342	\$12,952,067	\$1,059,996	\$1,890,852	\$161,684	\$4,001,725	\$112,085	\$396,644	\$7,604,929	\$5,347,138	\$995,155
Missouri, Kansas & Texas System...	3,865	11,211,654	1,297,490	16,756,916	2,019,767	2,508,062	338,556	5,478,466	91,724	540,320	11,934,929	4,821,988	913,005
Missouri, Oklahoma & Gulf...	334	588,529	32,800	708,840	211,912	2,508,062	338,556	5,478,466	91,724	540,320	11,934,929	4,821,988	913,005
Missouri, Oklahoma & Gulf of Texas...	125	99,788	2,518	103,710	18,032	11,517	9,761	33,291	670	4,934	711,435	-54,327	
Missouri Pacific	3,931	11,849,790	2,754,155	15,921,695	2,436,112	3,176,606	374,216	5,524,591	62,316	7,096	99,697	4,014	-7,669
Mobile & Ohio	1,122	4,904,996	633,349	5,855,976	616,918	1,278,203	211,487	2,032,117	13,958	184,812	4,310,567	1,536,409	146,958
Monongahela	86	834,561	243,311	2,827,652	104,317	60,961	5,660	177,995	.....	18,660	686,763	505,069	.....
Morgan's L. & Texas R. R. & S. Co.	405	1,886,109	337,760	2,862,420	334,788	395,828	69,729	805,503	14,208	1,688,726	1,321,196	485,622	-31,276
Nashville, Chattanooga & St. Louis...	1,231	4,410,966	1,372,964	6,268,211	699,621	1,172,788	298,276	1,602,203	57,971	266,954	4,594,638	1,673,573	702,314
Nevada Northern	165	791,656	64,521	880,632	113,286	78,010	4,015	161,690	439	29,984	387,124	493,508	298,752
New Orleans & North Eastern.....	204	1,392,722	294,594	1,878,964	206,349	343,180	60,615	572,762	33,897	67,878	1,284,680	594,284	185,367
New Orleans, Mobile & Chicago.....	402	795,293	146,977	988,344	143,081	159,607	25,565	299,361	—47	41,253	669,430	318,914	81,508
New Orleans Great Northern.....	285	631,886	162,931	876,018	112,306	142,776	16,467	248,970	1,051	555,638	317,379	28,459	18,519
New Orleans, Texas & Mexico.....	286	654,478	144,698	845,289	154,027	133,458	22,834	275,870	.....	58,451	635,640	209,649	66,094
New York Central Railroad.....	5,969	62,171,089	25,063,114	101,257,993	9,995,233	17,473,866	1,438,366	29,863,519	1,407,357	2,181,545	62,359,885	38,898,109	Not shown
New York, Chicago & St. Louis.....	569	5,823,134	763,500	6,854,674	516,127	1,031,795	276,160	2,634,725	22,209	127,374	4,608,391	2,246,284	848,799
New York, New Haven & Hartford.....	2,005	18,445,467	15,266,556	37,822,615	4,399,218	5,375,214	220,417	13,020,040	386,799	826,254	24,217,283	13,605,342	3,441,619
New York, Ontario & Western.....	568	3,049,037	652,402	4,792,443	652,402	717,499	45,223	1,686,101	.....	98,314	3,199,055	1,593,388	173,290
New York, Philadelphia & Norfolk.....	112	1,890,551	228,091	2,288,735	207,740	456,238	30,120	845,668	24,653	67,852	1,632,202	656,533	585,860
New York, Susquehanna & Western.....	140	1,224,925	305,5	1,714,407	136,630	175,954	11,355	755,337	.....	37,433	1,109,143	605,247	92,805

REVENUES AND EXPENSES OF RAILWAYS

SIX MONTHS OF FISCAL YEAR 1916—CONTINUED

Name of road.	Average mileage operated during period.	Operating revenues				Operating expenses				Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
		Freight.	Passenger.	Total (inc. misc.).	Maintenance of way and structures.	Equip. ment.	Traffic.	Trans- portation.	Miscel- laneous.				
Norfolk & Western	2,045	\$24,241,728	\$3,020,215	\$28,162,529	\$3,467,388	\$4,906,550	\$333,091	\$6,922,128	\$51,246	\$12,197,739	\$1,015,000	\$11,180,588	\$4,676,865
Norfolk Southern	908	1,499,350	580,101	2,223,309	297,665	316,598	45,798	755,947	666	19,845,163	2,308,211	17,533,810	4,954,779
Norfolk Pacific	6,493	28,405,802	7,630,811	39,400,653	4,460,621	3,641,894	581,542	10,116,448	519,406	1,399,781	102,987	883,132	309,803
Northwestern Pacific	507	306,443	1,203,473	2,386,216	345,881	45,103	3,357	122,807	.....	367,920	40,024	327,896	28,838
Oahu Railway & Land Co.	114	465,514	105,481	605,692	47,594	45,103	.....	.....	.....	6,577,689	822,635	5,755,054	4,299,177
Oregon Short Line	2,257	9,451,186	2,631,752	13,030,913	1,562,833	1,974,185	223,628	2,776,659	193,001	3,534,662	62,525	2,972,281	2,231,550
Oregon-Washington R. R. & Nav. Co.	2,027	5,844,629	2,491,240	9,070,579	1,246,223	1,747,714	282,324	2,605,616	77,714	1,064,315	77,760	986,555	470,391
Panhandle & Santa Fe	1,670	2,026,994	526,357	2,669,801	513,862	393,155	24,437	1,078,123	191,868	13,602,868	1,691,701	11,908,948	6,011,862
Pennsylvania Railroad	1,758	26,771,294	5,649,442	35,641,456	4,426,029	5,459,808	459,327	10,781,723	1,381,329	34,084,429	3,772,500	30,277,968	9,876,655
Pennsylvania Railroad	4,541	78,028,522	21,096,153	108,469,166	13,406,296	19,824,640	1,148,759	36,081,007	1,381,329	6,901,866	280,327	3,342,258	957,951
Pere Marquette	2,247	7,306,423	2,265,230	10,530,418	992,102	1,946,238	182,554	3,513,444	25,699	11,508,469	602,675	10,905,794	3,382,012
Philadelphia & Reading	1,120	23,086,712	3,440,830	27,811,425	2,117,301	4,396,933	286,092	8,929,255	73,433	3,220,163	322,864	2,897,300	1,053,861
Philadelphia, Baltimore & Washington	717	6,068,574	4,157,151	11,594,520	1,388,591	2,036,608	154,039	4,205,160	124	6,377,165	296,922	6,080,202	3,814,879
Pittsburgh & Lake Erie	225	9,633,408	902,942	11,158,124	1,491,268	1,491,268	82,699	2,207,150	20,201	15,856,095	983,151	6,164,949	1,911,560
Pittsburgh, Cincinnati, Chic. & St. Louis	1,489	16,005,637	4,504,326	23,006,080	3,287,789	4,041,340	389,516	7,436,514	156,112	15,856,095	11,322	36,826	235,715
Pittsburgh, Shawmut & Northern	294	1,131,678	57,896	1,207,089	178,800	276,061	9,570	335,094	.....	827,508	60,000	427,334	162,217
Port Reading	21	764,426	479,420	1,241,849	57,798	67,374	230	285,833	.....	420,399	40,000	420,399	120,960
Richmond, Fredericksburg & Potomac	88	754,207	429,420	1,241,849	1,421,849	1,768,411	20,914	487,972	17,338	860,999	48,244	512,941	146,443
Rutland	468	1,012,710	664,434	1,916,247	244,837	290,336	56,019	637,062	6,431	1,270,077	101,541	584,621	15,993
St. Joseph & Grand Island	258	674,492	162,514	892,317	174,703	135,275	26,077	289,264	.....	660,587	49,670	181,944	15,993
St. Louis & San Francisco	4,750	15,833,385	5,707,797	22,941,383	3,529,000	3,437,885	382,907	7,116,838	.....	8,070,161	1,045,234	7,013,809	946,045
St. Louis, Brownsville & Mexico	548	867,504	393,329	1,362,994	232,705	172,668	32,041	411,176	.....	898,593	55,389	40,201	167,807
St. Louis, Iron Mountain & Southern	3,363	12,494,757	2,944,076	16,597,751	2,503,915	3,257,490	349,379	4,367,686	44,659	5,519,109	665,761	4,852,085	508,189
St. Louis, Merchant's Bridge Terminal	9	.....	1,292	1,066,020	132,486	44,441	4,686	466,361	.....	690,962	375,058	315,904	108,334
St. Louis, San Francisco & Texas	244	405,398	146,078	608,163	140,286	93,563	11,952	225,728	.....	525,706	11,484	70,807	2,695
St. Louis, San Francisco	943	3,069,470	709,893	4,023,993	294,397	596,184	163,791	944,799	20,809	1,856,680	179,782	1,675,210	638,630
St. Louis, Southwestern of Texas	811	1,582,399	512,283	2,256,786	336,883	463,862	79,051	822,623	4,261	451,525	110,094	430,838	502,611
St. Louis, Western of Texas	774	1,600,751	550,950	2,294,834	397,428	339,189	191,558	902,439	146,873	544,750	114,104	430,638	229,639
San Antonio & Aransas Pass	1,147	3,243,578	1,742,856	5,334,648	492,293	790,853	193,568	1,363,867	.....	2,257,537	301,066	1,955,923	669,277
San Pedro, Los Angeles & Salt Lake .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seaboard	7,022	22,764,682	8,595,619	34,376,793	4,127,613	5,393,485	932,177	11,281,829	176,827	11,673,102	1,398,849	10,259,391	3,315,610
Southern	6,933	36,296,658	19,365,670	61,347,347	6,499,786	8,164,253	1,144,957	17,908,713	1,143,470	25,193,315	2,495,110	22,698,998	3,771,547
Southern Pacific	555	1,567,429	864,473	2,667,602	241,175	207,093	49,115	561,027	22,818	1,514,401	320,400	1,193,417	181,700
Spokane, Portland & Seattle .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Staten Island Rapid Transit Co.	11	269,729	165,039	616,774	58,336	58,336	4,498	228,952	.....	276,726	30,000	246,725	55,637
Tennessee Central	294	564,182	203,441	815,867	170,341	106,960	34,360	299,124	.....	650,326	28,340	136,750	69,356
Terminal R. R. Ass'n of St. Louis	37	1,521,021	551,357	2,276,730	152,879	79,895	5,396	464,698	.....	734,315	153,455	580,863	313,555
Texas & New Orleans	468	1,521,021	551,357	2,276,730	330,290	483,046	47,415	773,045	57,477	1,751,247	123,304	400,730	313,555
Texas & Pacific	1,944	7,057,718	2,307,612	10,066,171	1,128,339	1,503,860	226,010	3,751,028	79,440	6,631,927	501,638	2,650,166	412,862
Toledo & Ohio Central	436	2,160,771	319,340	2,650,269	327,306	494,479	40,791	895,355	11,146	1,827,793	145,670	676,574	14,829
Toledo, Peoria & Western	248	358,475	242,284	641,372	100,312	169,394	13,117	233,273	.....	538,314	35,000	68,058	35,368
Toledo, St. Louis & Western	451	2,422,667	203,428	2,794,633	363,244	425,042	97,292	885,379	.....	972,001	107,542	864,459	412,900
Ulster & Delaware R. R.	129	289,248	204,980	594,415	69,918	61,220	8,586	229,650	.....	387,016	21,000	184,078	92,551
Union Pacific Railroad	3,617	22,874,895	5,945,415	31,918,537	4,035,485	3,862,659	712,985	7,369,979	530,600	14,704,610	1,239,131	13,461,973	1,292,198
Union R. R. Co. of Baltimore	8	708,172	131,979	850,701	111,776	111,776	.....	27,649	.....	698,232	30,321	667,912	7,130
Union R. R. of Pennsylvania	31	.....	.....	2,903,246	225,795	555,369	635	967,289	.....	1,777,704	45,104	1,080,438	826,038
Vandalia	917	4,317,186	1,247,726	6,269,272	912,846	1,114,045	139,969	2,100,027	58,972	1,792,233	225,525	1,565,957	398,826
Vicksburg, Shreveport & Pacific	238	503,566	246,391	824,855	137,165	153,979	20,665	252,082	12,684	606,905	49,241	176,709	116,955
Virginia & Southwestern	504	2,933,692	233,565	3,373,897	147,777	147,777	12,467	265,298	.....	324,230	40,247	283,982	34,835
Virginian	2,519	12,137,760	3,778,108	16,877,872	2,050,562	2,587,483	494,525	6,036,974	94,659	11,638,473	485,072	4,751,475	1,408,155
Wabash	36	255,890	270,940	690,445	87,860	87,860	8,271	227,518	7,620	261,909	21,551	240,346	112,724
Washington Southern	358	1,313,129	2,523,703	4,164,263	682,468	78,126	75,940	1,503,221	17,397	1,249,132	164,000	1,085,132	176,352
West Jersey & Seashore	664	4,652,338	519,808	5,405,338	639,837	859,237	130,194	1,730,062	29,733	3,502,502	1,902,836	1,738,836	794,196
Western Maryland	941	2,374,272	1,274,133	3,948,716	57,770	391,377	139,308	1,167,978	110,508	2,478,406	163,817	1,305,402	821,783
Western Pacific	133	379,783	212,748	661,471	102,320	132,086	34,837	181,134	10,547	173,366	33,423	137,213	33,423
Western Ry. of Alabama	512	3,756,418	329,610	4,403,642	500,462	676,513	49,809	1,250,391	10,629	2,663,830	207,762	1,532,043	895,477
Wheeling & Lake Erie	1,382	5,459,614	1,272,745	7,052,741	990,132	1,045,040	106,213	2,100,844	8,675	4,414,052	300,000	2,337,463	826,599
Yazoo & Mississippi Valley .....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....

* This road reorganized and the Carolina, Atlantic & Western Ry. merged therewith as of December 1, 1915. No cumulative figures shown.

Traffic News

The Atchison, Topeka & Santa Fe has raised its embargo on wheat shipments for export through the port of Galveston.

The western transcontinental railroads have announced that colonist rates from points in the east and middle west to the Pacific coast will be effective from March 25 to April 14, inclusive.

The Atchison, Topeka & Santa Fe resumed service on February 18 between Los Angeles, Cal., and San Diego, where the line had been washed out in several places during the recent disastrous floods.

For three days, February 4 to 7, the Northern Pacific paraded through the streets of New York City a large auto truck loaded with potatoes weighing 2 lb. to 3 lb. each, and bearing a large sign stating that these potatoes were representative of those served, with the compliments of the Northern Pacific, at the annual banquet of the Far Western Travelers' Association held at Hotel Astor on the evening of February 7, and of those served on the Northern Pacific dining cars every day.

Great Lakes Transit Company

This company, formed to acquire and run steamships heretofore operated by railroad companies, completed its organization this week. Announcement was made by Levy Mayer, of Chicago, general counsel of the company, on behalf of W. J. Conners, of Buffalo, who was elected chairman of the board of directors. The company will control 85 per cent of the passenger packet freight, and grain steamships navigating the great lakes. Its fleet will comprise twenty-five vessels, with a freight capacity of 150,000 tons.

The capitalization, it was announced, will be \$20,000,000. Tariffs for through rail-and-water east and west bound traffic will be filed with the Interstate Commerce Commission before April 1. The rates, it was stated, will not differ from those which prevailed before lake navigation closed last December.

The ships purchased by the company include all except six of those which have been operated on the lakes of the Pennsylvania, the New York Central, the Erie, the Delaware, Lackawanna & Western, the Lehigh Valley and the Rutland railroads. Among the fleets acquired was that of the Mutual Transit Company of Buffalo, the stock of which was owned jointly in equal amounts by the Lehigh Valley, the New York Central, the Erie and the Lackawanna. The statement as to six ships not acquired refers, evidently, to those of the Lehigh Valley, which that company, according to an announcement made this week, plans to operate next season the same as heretofore. The company expects favorable final action in its suit to enjoin the enforcement of the Interstate Commission's prohibiting order.

The first cash payment of the new company to the railways has already been made, it is said, and the balance will be paid by April 1. The total purchase price was not announced, owing to the fact that negotiations have not yet been completed for the ownership of terminal properties in several of the lake cities. The principal operating offices will be in Buffalo.

James Carey Evens, now vice-president and general manager of the Anchor Line, whose boats the new company took over from the Pennsylvania Railroad, will be president. Other officers elected, all residents of Buffalo, are: Marvin M. Marcus, vice-president in charge of finance; Harry Seymour Noble, vice-president in charge of traffic; Edwin T. Douglas, manager of vessel operations; Merton L. White, assistant to the president; W. B. Evans, auditor; L. W. Lake, general freight agent; F. A. Stanley, assistant general freight agent; Harry D. Hosmer, general passenger agent; R. M. Russell, secretary and treasury.

RAILWAY CONSTRUCTION IN CHILE.—The general engineering office of Valparaiso has presented to the government a project for the construction of a single-track railway from Valparaiso to Santiago via Casablanca, with the request that the government grant permission for the construction of this line, and undertake to guarantee the cost of construction.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

Special Examiner Eddy, of the Interstate Commerce Commission, held a hearing at Houston, Tex., last week, in a general inquiry into the practice of the railways in issuing free transportation within the state of Texas, especially to shippers. A number of shippers testified to having received passes, but said that it had not influenced them in the routing of their freight. Railroad men testified that they had not issued passes unlawfully. Some said they did not believe in the practice, but that if some lines gave passes it was necessary for the others to do so. Among those who testified were W. B. Scott, president of the Sunset-Central Lines; C. K. Dunlap, traffic manager of the Sunset-Central Lines; A. G. Whittington, general manager of the International & Great Northern; Horace Booth, traffic manager of the International & Great Northern; J. S. Pyeatt, manager for the receivers of the St. Louis, Brownsville & Mexico, and S. S. Butler, traffic manager of the same road.

Class Rates from Michigan and Wisconsin Points

Opinion by Commissioner Meyer:

The commission finds that the carriers have justified a proposed increase in rates, given in a tariff of Eugene Morris, agent, from Green Bay shore points to points in central freight association and eastern trunk line territories to the extent that the rates exceed the present rates from Milwaukee or Manitowoc plus differentials of 6, 5, 4, 3, 2 and 2 cents on the six classes respectively. The readjustment is made primarily to eliminate some inconsistencies in the present rate arrangement. (37 I. C. C. 739.)

Rates to Astoria, Ore.

City of Astoria v. Spokane, Portland & Seattle et al. Opinion by Commissioner Harlan:

Astoria, Ore., is on the south side of the Columbia river, about 10 miles from the Pacific Ocean, and has a population of about 15,000. Portland, Ore., is on the Willamette river about 100 miles further inland, Seattle and Tacoma, both in Washington, are on Puget Sound, which opens into the Pacific Ocean through the strait of Juan de Fuca, about 150 miles north of the mouth of the Columbia river.

Complaint is made in this case that there is a discrimination against Astoria in that although that city is as favorably located as Tacoma and Seattle it is not given as favorable rates to points in the inland empire. Astoria is reached only by the Spokane, Portland & Seattle, owned jointly by the Great Northern and Northern Pacific. At present to and from points east of a line drawn from Buford in North Dakota, to Trinidad, Colorado, Astoria is accorded the same rates as Seattle, Tacoma and Portland; and to many points in Montana west of that line the rates on lumber from all four points are the same. That section of the country extending from the Cascade Mountains west to the Rocky Mountains on the east and including the eastern portions of the states of Oregon and Washington, western Montana, and practically entire Idaho, is generally known as the inland empire. To and from points in this extensive territory the rates between Astoria are generally higher than those charged by the carriers operating from Puget Sound and the Washington coast. On class traffic between Astoria and the inland empire the rates are made by combination on Portland.

The commission finds that these north Pacific coast ports have a closer geographic and economic relation than is reflected in the tariffs and that the latter discriminate against Astoria and unduly prefer the Puget Sound ports. There is also such a relationship between Seattle, Tacoma, Astoria, and Portland as to require them to be considered as forming more or less of a natural rate group with respect to much of the traffic in question.

It therefore orders that between Astoria and all points in this territory on or east of the line of the Northern Pacific, extending from Pendleton, Ore., through Pasco and Kennewick to Spokane, all in Washington, and on or east of the line of the

Great Northern, extending from Spokane northward, the rates should not exceed the rates between Seattle, Tacoma, and Portland, and such points; between Astoria and points on the Oregon-Washington east of Pendleton, and points on the Oregon Short Line the rates should not exceed the rates between Seattle and Tacoma and such points; as to points north of Kennewick and west of the competitive territory just described the Astoria rates may exceed the Portland rates in the same amount that the Portland rates are higher than the Seattle and Tacoma rates provided the arbitraries over Portland shall in no case exceed the local rate between Portland and Astoria; as to stations on the Oregon-Washington and stations on the Spokane, Portland & Seattle, west of Pendleton and east of the Cascade Mountains, the Astoria rates may exceed the Portland rates by the same amount that the Seattle and Tacoma rates are higher than the Portland rates, the differentials over Portland in no case to exceed the local rate between Portland and Astoria. (38 I. C. C. 16.)

New Orleans-Texas Rates

Opinion by Commissioner Clements:

The commission finds that the carriers have justified proposed increased class rates between New Orleans, La., and Orange, Beaumont, Houston and Galveston, Tex., and points taking the same rates. The first class rates proposed are as follows: New Orleans to Orange (258 miles) 82 cents, to Beaumont (279 miles) 86 cents, and to Houston, Tex., (363 miles) 89 cents. The present rates to Beaumont and Orange are on a basis of 60 cents first class. These rates were established to meet water competition now not in existence.

In its opinion the commission states that the scale of class rates now in effect from New Orleans to the Texas points here involved is a depressed scale, when compared with scales it has found reasonable for similar distances in the same general territory. The 60-cent scale in effect from New Orleans to Orange and Beaumont, which the respondents propose to cancel, is as low or lower, mileage considered, than the scale of class rates now in effect from the Mississippi river crossings, St. Louis to Dubuque, Iowa, to points on the Missouri river, Kansas City, Mo., to Sioux City, Iowa. (38 I. C. C. 1.)

New Orleans Joint Traffic Bureau v. Morgan's Louisiana & Texas et al. Opinion by Commissioner Clements:

The defendants maintain from New Orleans, La., to Houston, Galveston, Beaumont, Port Arthur, Orange, Port Neches, East Beaumont, West Port Arthur, and Sabine, Tex., and certain other points in Texas in the vicinity of the points named, commodity rates on a large number of articles which are higher than the class rates, governed by the western classification, otherwise applicable to the same articles.

The defendants, however, have now increased the class rates between New Orleans and the Texas points named, and provided by an alternative clause in the tariff for the application of either the class or commodity rate, whichever is lower, this removing the ground of the complaint. (38 I. C. C. 11.)

STATE COMMISSIONS

The Atchison, Topeka & Santa Fe, the Chicago, Rock Island & Pacific, the Missouri Pacific, the Missouri, Kansas & Texas, the St. Louis & San Francisco, and the St. Joseph & Grand Island railroads on February 16 filed an application with the Kansas Public Utility Commission for permission to make a horizontal increase of 20 per cent in intrastate freight rates.

The Railroad Commission of Louisiana has granted the application of the express companies doing business in that state to make a small advance in rates for the transportation of merchandise, in small packages. Two years ago a large reduction in rates was made, by order of the commission, and the present order is a recognition of the fact that some of the reductions were too severe. The Interstate Commerce Commission has granted a similar request in regard to interstate rates.

COURT NEWS

Judge Van Fleet, of the United States District court at San Francisco, has rendered a decision that the Interstate Commerce Commission has no authority to examine correspondence between

shippers and railroad companies. The decision was rendered after the receiver of the Western Pacific had submitted to the court a demand by the commission for the records and correspondence concerning claims paid to the California Fruit Distributors' Association. The court ruled that the commission might look into the records but not into the correspondence.

Judges Munger, Smith and Wade, of the United States court at Omaha, Neb., on February 16, issued a temporary injunction restraining the Nebraska Railway Commission from interfering with the Chicago, Rock Island & Pacific in advancing its intrastate passenger fares in Nebraska from two cents a mile to three cents. The court held that the lower rate was unconstitutional in that it was confiscatory, saying that it was "convinced that the two-cent fare rate prescribed by the state law is confiscatory of the property of the railway company, and has not, does not and will not yield sufficient revenue to pay the operating expenses of the intrastate passenger business of the railway company, and to make a constitutional return upon the investment," and that "the present income, measured by the experience of the last three years, is inadequate to pay a reasonable return upon the actual value of the property, as estimated by the railway commission of the state." The railroad announced that the increased rate would become effective as soon as the receiver executed the bond of \$50,000, in accordance with the court's instructions. Purchasers of tickets at the increased rate will be given a coupon entitling them to recover the difference due to the increase if the two-cent rate is eventually upheld.

Judge Slate, of the Circuit court of Cole county, Missouri, on February 16, issued a decision that the recent order of the Missouri Public Service Commission allowing general advances in freight and passenger rates throughout the state is unconstitutional. The decision was rendered in the case of M. E. Rhodes against the commission in which Rhodes questioned the constitutional right of the commission to authorize rates above those fixed by the state legislature. The new rates were to have been put into effect on March 1. The commission has appealed to the supreme court of Missouri.

Cost of Repairing Grain Cars

A tariff provided: "When cars furnished by carriers for grain or other loading require repairing in order to insure against leakage in transit, and material necessary for this repair is furnished by the shipper, the carrier will pay the actual cost of the same, but not to exceed 80 cents a car." The Kansas Supreme Court holds that the words "actual cost of the same" include the cost of the material and labor necessary to repair, but do not include the cost of inspecting or cleaning cars or the cost of attaching grain doors.—Rock Mill, etc., Co. v. A. T. & S. F. (Kan.), 154 Pac., 254.

Pollution of Railroad's Reservoir by Stock

The right to use water in a reservoir or pond conveyed to a railroad company was reserved to the land owner. The latter's animals so polluted the water that it was unfit for use in locomotives, the purpose for which the railroad desired it; and the railroad fenced the pond. The land owner sued in equity to enjoin the fencing and for damages. The Iowa Supreme Court holds that in such a case each party must exercise his rights with reference to the rights of the other, and the land owner could not allow his stock so to pollute the water. The railroad, however, could not exclude the land owner from all use, but should apply to the courts to restrain the pollution.—McCoy v. C. M. & St. P. (Iowa), 155 N. W., 995.

Louisville & Nashville Must Pay Transfer Tax on Realty Bought from Lewisburg & Northern

The state of Tennessee sued to collect a state tax of \$1 per \$1,000 on the consideration or value of property transferred by the Lewisburg & Northern to the Louisville & Nashville. This property consists of all the vendor's trackage, road bed, rolling stock, equipment, franchise, etc., and its yards near Mayton, covering 300 acres, and about 800 acres west of the yards, used or to be used for drainage area and reservoir site. The L. & N. did not deny liability for the transfer tax on the franchise, but

denied liability as to the real estate. The principal question in the case was whether the transaction came within section 10 of chapter 101, acts of Tennessee, 1915, as maintained by the railroad, or within section 8, as claimed by the state. Section 8 provides that "on all transfers of realty there shall be levied and paid in lieu of all other taxes a state tax of \$1 per \$1,000 on the consideration, which shall in no case be less than the value of the property." Section 10 provides that any corporation, acquiring by lease, purchase, consolidation, or merger, the property and exercising the franchise of another corporation, shall pay to the State of Tennessee a privilege tax of one-tenth of one per cent on the amount of the outstanding capital stock of the vendor corporation. The Tennessee Supreme Court holds that the tax provided for in section 10 "is imposed upon the privilege of exercising that franchise of the acquired corporation, and not upon the acquisition of its property, because it is manifest from the plain meaning of this section that merely acquiring the property without exercising the franchise would not make the purchasing corporation liable for the tax."

"I am of the opinion," said Chancellor Newman, "that the privilege tax provided for in section 10 applies where a corporation acquires by lease, etc., the property and franchise of a domestic corporation, and on acquiring such property exercises such franchise, but that it does not apply to and cover a transfer of the real property of a corporation to another corporation. To place any other construction on section 10 would be to render said section unconstitutional, because to construe it as covering the conveyance of the realty of a corporation would place lands owned and conveyed by a railway company on a different basis from lands conveyed by individuals."

"It is manifest that the tax imposed by section 8 does apply to all transfers of realty of a railroad company known and classified as localized realty, but whether it would apply to the roadbed is not now determined."

"The vendee and not the vendor is liable for the tax provided for in section 8."

The total claim of the state was \$15,000, or one-tenth of one per cent, on the mortgage of \$15,000,000.—*State v. L. & N.* Decided February 10, 1916.

Passing Between Cars—Contributory Negligence

An adult person, in attempting to pass over the coupling between two cars which were standing on a street crossing and were liable to be moved by an engine attached to them for switching purposes, is guilty of contributory negligence, which will preclude a recovery for his injury and death in consequence of the moving of the cars.—*Pansk v. M. P.* (Neb.), 155 N. W., 1095.

Privilege of Stopping Cattle to Test Markets

Cattle were shipped over the Atchison, Topeka & Santa Fe from Belvidere to Peabody with "Wichita privilege." The railroad carried them straight through to Peabody, where the owner, who was waiting for them at Wichita, had made no provision for them. He sued the company for consequent damages. The Kansas Supreme Court held, the cattle having been billed and shipped at the regular rates, which had been published and filed with the Public Utilities Commission, that the special contract, granting the privilege, was preferential and discriminatory, and violated the railroad and utilities acts. Where the tariffs of the carriers specify the points at which live stock may be stopped in transit to test the market, any special contract enlarging that privilege is void. The filed tariffs did not include shipments to Peabody.—*Mollohan v. Atchison, T. & S. F.* (Kan.), 154 Pac., 248.

DIRECT RAILWAY BETWEEN TURIN AND NICE.—Since the outbreak of the war work on the French portion of the Nice & Cuneo Railway, with the exception of the piercing of the two principal tunnels—the Braus, 3 miles 1,225 yards, and that of Mont Grazian, 2 miles 722 yards, in length—has been at a standstill. At the former of these, the Braus, a junction of the two headings, driven from each side, was effected at the end of September. It is stated on good authority that work on this railway will shortly be resumed on the French side. In Italy the line is now open for traffic to within a mile of the frontier line at San Dalmazzo, the distance from Turin being 91 miles.

Railway Officers

Executive, Financial, Legal and Accounting

A. J. Biard, assistant auditor of the Texas & Pacific at Dallas, Tex., has been appointed auditor, vice L. G. Scott, effective March 1.

E. I. Grenfell, formerly auditor of the Ft. Worth & Denver City, has been appointed auditor of the Denver & Salt Lake, vice E. W. Meyer.

W. C. Logan has been elected auditor of the Ft. Worth & Denver City, vice E. I. Grenfell, resigned to accept service with the Denver & Salt Lake.

William E. Murphy has been appointed auditor of passenger traffic of the Philadelphia & Reading and subsidiary companies, at Philadelphia, Pa., vice Llewellyn Snowden, deceased.

A. K. Masters, assistant freight claim agent of the Michigan Central, has been appointed freight claim agent, vice L. J. Brinkman, with office at Detroit, Mich. F. B. McIlvane, district freight claim agent at Chicago, Ill., has been appointed assistant freight claim agent, vice A. K. Masters, with office at Detroit. G. F. Wheeler has been appointed district freight claim agent at Chicago, vice Mr. McIlvane, promoted.

Operating

Charles M. Anderson has been appointed superintendent of safety of the Nashville, Chattanooga & St. Louis.

J. W. Kelly, Jr., superintendent of the Baltimore & Ohio at New Castle, Pa., has been appointed general manager of the Dayton & Union Railroad and the Dayton Union Railway, with headquarters at Dayton, Ohio, succeeding H. R. Hanlin, transferred. T. E. Jamison, train-master of the Chicago division at Garrett, Ind., succeeds Mr. Kelly.

Frank M. Barker, assistant superintendent of the Lehigh Valley at Wilkes-Barre, Pa., has been appointed superintendent of the Wyoming division, with headquarters at Wilkes-Barre,



F. M. Barker

succeeding C. J. Shea, who will be assigned to other duties. Mr. Barker began railway work with the New York, Philadelphia & Norfolk, in Virginia. He later served on the New York Central at Buffalo, and on the Colorado Midland as operator, agent and extra despatcher. In September, 1892, he entered the service of the Lehigh Valley as agent at Rochester Junction, N. Y. Afterwards for a brief period he was yardmaster, and then terminal trainmaster for the Rock Island at Herington, Kan., and at Council Bluffs, Iowa. In November, 1905, Mr. Barker returned to the

service of the Lehigh Valley as agent at Rochester, and subsequently served as yardmaster at Sayre, inspector of transportation at South Bethlehem, and trainmaster at Auburn. On October 15, 1912, he was appointed assistant superintendent at Wilkes-Barre, and now becomes superintendent of the Wyoming division of the same road, as above noted.

Traffic

K. L. Hamilton, Jr., has been appointed commercial agent of the Carolina, Clinchfield & Ohio, with office at Ashland, Ky.

P. T. McKirahan has been appointed general agent freight

department of the Atchison, Topeka & Santa Fe, with office at Tulsa, Okla.

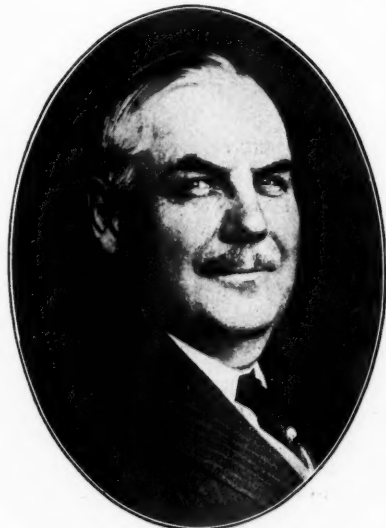
A. C. Carper, commercial agent of the New Orleans, Mobile & Chicago, with office at St. Louis, Mo., has opened an additional office at 437 Marquette building, Chicago, Ill.

E. L. Sheehan, city ticket agent of the Canadian Pacific at Chicago, Ill., has been appointed general agent, passenger department at St. Louis, Mo., vice A. J. Blaisdell promoted.

George Lewis Robinson, whose appointment as general passenger agent of the New York, Ontario & Western, with headquarters at New York, has already been announced in these columns, was born at Toledo, Ohio. He was educated in the public schools of his native town and at Detroit, Mich. On October 1, 1883, he entered the service of the Michigan Central in the auditor of passenger account's office. From 1890, to December, 1894, he served as passenger rate clerk on the New York Central. He went to the New York, Ontario & Western as chief passenger rate clerk in 1894, and has been in the continuous service of that road ever since. From 1905, to December, 1913, he was chief clerk in the traffic department, and then was assistant general passenger agent, until his recent appointment as general passenger agent of the same road, as above noted.

Clarence E. Stone, whose appointment as passenger traffic manager of the Great Northern has been announced in these columns, was born on February 14, 1859. He entered railway

service in 1874, as a freight brakeman on the Chicago, Milwaukee & St. Paul; in 1875, he became a telegraph operator for the same road, and in 1877, entered the employ of the Chicago, Burlington & Quincy as a telegraph operator and station agent. He went to La Crosse, Wis., in 1878, to become assistant ticket agent for the St. Paul, and subsequently served in the same capacity at Minneapolis and St. Paul, Minn. From 1883 to 1897, he was city passenger agent for the Northern Pacific at St. Paul, and from 1897 to June, 1900, general passenger agent for the St. Paul & Duluth,



C. E. Stone

now a part of the Northern Pacific. From June, 1900, to March, 1901, he was assistant general passenger agent of the Northern Pacific, and from March 1, 1901, to April 1, 1905, assistant general passenger agent for the Great Northern. In April, 1905, he was appointed general passenger agent for the same railroad, and continued in that position until October, 1914, when he was made general traffic manager of the Great Northern Pacific Steamship Company, with office at San Francisco, Cal. As passenger traffic manager of the Great Northern, he will have headquarters at St. Paul, Minn.

Theodore Harte, traveling freight agent of the Western Pacific at Elko, Nev., has been appointed general agent, with office at Salt Lake City, Utah.

R. L. De Groodt has been appointed general agent of the Chicago Great Western, with office at Mason City, Iowa, vice F. C. Eslick, resigned.

C. A. Butler, chief of the tariff bureau of the Chicago, Milwaukee & St. Paul, has been appointed assistant general freight agent, with headquarters at Chicago, Ill.

J. B. Coffey has been appointed assistant general freight agent of the Atchison, Topeka & Santa Fe, with office at Chicago, Ill. He was born in Chicago on January 5, 1881, and began his business career as an employee of the Chicago and Ohio River Freight Committee in 1896, and entered the service of the Santa Fe in 1897. From that time until 1903 he was successively office

boy, bill of lading clerk, rate clerk and contracting freight agent in the office of the general agent at Chicago. From 1903 to 1906 he was stationed at Milwaukee, Wis., as contracting agent. At the end of this time he returned to Chicago as claim clerk in the freight traffic department; in 1908 he was promoted to chief rate clerk, and in 1911 to assistant chief clerk. His appointment as assistant general freight agent was effective on February 15.

Engineering and Rolling Stock

Lee Barnes has been appointed acting roadmaster of the Northern Pacific at Little Falls, Minn., vice Austin Grimes.

M. R. Smith has been appointed master mechanic of the Lehigh Valley at Wilkes-Barre, Pa., in place of W. G. Burrows, who has been assigned to other duties.

Purchasing

George W. von Osthoff has been appointed purchasing agent of the Southern Pacific Company, Atlantic Steamship Lines, with office at New York.

Special

W. W. Inglis, general manager of the Pennsylvania Coal Company, has been appointed general manager of the coal mining department of the Delaware, Lackawanna & Western with headquarters at Scranton, Pa., succeeding A. C. LaMonte, deceased. C. E. Tobey, general superintendent of the coal mining department, has resigned and this position has been abolished.

OBITUARY

W. T. Tucker, paymaster of the Seaboard Air Line since 1880, died at Portsmouth, Va., on February 17, at the age of 82.

Joseph S. Ward, resident engineer of the Philadelphia & Reading, died recently in Williamsport, Pa., at the age of 60.

James Patterson Kerr, formerly auditor of the Northern Central previous to 1903, died on February 17, in Baltimore, Md., at the age of 76.

Calvin C. Turner, formerly until 1913 master mechanic of the Philadelphia, Baltimore & Washington at Wilmington, Del., died on January 25, at his home in Wilmington at the age of 64.

C. I. Tuttle, assistant general freight agent of the Oregon Short Line, whose death was announced last week, was born at Bellows Falls, Vt., in 1857. He went west about 25 years ago and entered the service of the Union Pacific as a traveling live stock agent, with headquarters at Omaha, Neb. In 1895, he was transferred to Salt Lake City in the same capacity, and when the Union Pacific and the Oregon Short Line were segregated was appointed general live stock agent for the Short Line. In 1905, he was promoted to assistant general freight agent for the same railroad, and continued to hold this position up to the time of his death.

William N. Royall, who resigned as general manager of the Atlantic Coast Line in November, 1915, on account of ill health, died on February 21 at Wilmington, N. C. He was born on July 5, 1852, at Petersburg, Va., and began railway work in September, 1870, as a telegraph operator on the Wilmington, Columbia & Augusta. From 1874 to 1876 he served as conductor and train despatcher on the same road, and then became master of trains on the Charlotte, Columbia & Augusta. From September, 1880, to January, 1883, he held the same position on the Northeastern Railroad of South Carolina, and subsequently served as assistant superintendent until January, 1889, when he became superintendent of the same road, now the Charleston division of the Atlantic Coast Line. On July 1, 1902, he was appointed general superintendent of the First division of the Atlantic Coast Line, and in April, 1905, was appointed general manager of the same road.

SIBERIAN RAILWAY NOTES.—For the transportation in carloads of cereals, except oats, by the direct Russo-Chinese land export route from points on the Tchelyabinsk-Novo-Nikolaievsk and Tyumen-Kulomsino sections of the Omsk Railroad, and points on the Tomsk Railroad, via stations Manchuria and Pograditchnaya, to Vladivostok for export, a special low tariff was established from November 25, 1915.

Equipment and Supplies

LOCOMOTIVES

THE JAVA STATE RAILWAYS are inquiring for one Mallet (2-8-8-0) type locomotive.

THE CENTRAL OF BRAZIL is inquiring for prices on 6 Mallet (0-8-8-0) type locomotives.

G. AMSINCK & Co., New York, are in the market for one wood-burning Mogul type locomotive.

THE OREGON SHORT LINE has ordered one 12 ft. cut rotary snow plow from the American Locomotive Company.

THE ANACONDA COPPER MINING COMPANY, Anaconda, Mont., is in the market for 2 four-wheel switching locomotives.

THE BALTIMORE & OHIO is reported to have issued inquiries for 50 Mikado and 15 switching locomotives.

THE WESTINGHOUSE ELECTRIC & MANUFACTURING COMPANY has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE ST. LOUIS & SAN FRANCISCO, reported in last week's issue as contemplating the purchase of 30 Santa Fe type locomotives, has issued inquiries for these locomotives.

THE TEMISKAMING & NORTHERN ONTARIO, reported in the *Railway Age Gazette* of February 18 as being in the market for 6 Mikado locomotives, has ordered these engines from the American Locomotive Company.

THE SIOUX CITY TERMINAL RAILWAY has ordered one six-wheel switching locomotive from the American Locomotive Company. This locomotive will have 19 by 24 in. cylinders, 50 in. driving wheels, and a total weight in working order of 117,000 lb.

THE ST. PAUL BRIDGE & TERMINAL RAILWAY has ordered one Mogul type locomotive from the American Locomotive Company. This locomotive will have 20 by 26 in. cylinders, 51 in. driving wheels, and a total weight in working order of 154,000 lb.

THE BESSEMER & LAKE ERIE, reported in the *Railway Age Gazette* of January 28 as inquiring for 20 locomotives, has ordered 20 Santa Fe type locomotives from the Baldwin Locomotive Works. These locomotives will be equipped with superheaters and Street stokers.

THE EL PASO & SOUTHWESTERN has ordered 3 Mikado locomotives from the American Locomotive Company. These locomotives will have 29 by 30 in. cylinders, 63 in. driving wheels, and a total weight in working order of 321,000 lb. They will be equipped with superheaters and Street stokers.

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for a second-hand 50-ton, six-wheel switching locomotive, not over 9 ft. wide, and for a second-hand six-wheel, saddle-tank switching locomotive weighing about 45 or 50 tons, with 16 by 24-in. cylinders and 44-in. driving wheels.

THE CHICAGO & CALUMET RIVER, reported in the *Railway Age Gazette* of January 21 as inquiring for prices on one or two locomotives, has ordered one six-wheel switching locomotive from the American Locomotive Company. This locomotive will have 20 by 26-in. cylinders, 50-in. driving wheels, and a total weight in working order of 129,000 lb.

THE LEHIGH VALLEY has ordered 20 Mikado locomotives from the Baldwin Locomotive Works. These locomotives are in addition to 10 locomotives of the same type reported in the *Railway Age Gazette* of October 22, and 10 reported in the issue of December 10. Like the former 20 engines, the additional locomotives will be equipped with superheaters and Street stokers.

THE ILLINOIS CENTRAL, reported in the *Railway Age Gazette* of January 21 as having issued inquiries for 20 Pacific type locomotives, has ordered these locomotives from the American Locomotive Company. The locomotives will have 26 by 28-in. cylinders, 75-in. driving wheels, and a total weight in working order of 273,000 lb. They will be equipped with superheaters.

THE QUELIMANE RAILWAY of Portuguese East Africa, reported in the *Railway Age Gazette* of January 28 as having ordered 2 Mogul type locomotives from the American Locomotive Company, has ordered through G. Amsinck & Co., New York, 2 more locomotives of the same type from the American Locomotive Company. These 2 locomotives will have 13 by 18-in. cylinders, 34½-in. driving wheels, and a total weight in working order of 53,000 lb.

THE CHICAGO & NORTH WESTERN has asked bids on 77 locomotives, of which 2 Pacific type and 10 Mikado type engines will be used on the Chicago, St. Paul, Minneapolis & Omaha, and the remaining 65 on the North Western lines proper. The combined inquiry calls for 18 6-wheel switching locomotives with a total weight of 145,000 lb., 10 six-wheel switching locomotives with a total weight of 165,000 lb., 8 Pacific type engines with a total weight of 260,000 lb., 6 Pacific type with a total weight of 229,000 lb., and 35 Mikado type with a total weight of 302,000 lb.

THE NEW YORK CENTRAL has ordered 70 Mikado and 25 eight-wheel switching locomotives from the Lima Locomotive Corporation and 27 Mountain type, 25 eight-wheel switching and 3 Mallet (0-8-8-0) type locomotives from the American Locomotive Company. The Mallet type locomotives will have 26 and 40 by 28 in. cylinders, 51 in. driving wheels and a total weight in working order of 466,000 lb.; of the three, two are for the Michigan Central. It is also understood that the New York Central will build 10 or 20 eight-wheel switching locomotives for the Cleveland, Cincinnati, Chicago & St. Louis.

FREIGHT CARS

THE WABASH-PITTSBURGH TERMINAL has issued inquiries for 800 gondola cars.

THE GREAT NORTHERN is in the market for 500 refrigerator cars and 25 12,000-g. oil tank cars.

THE NEW YORK, ONTARIO & WESTERN has ordered 20 underframes from the Pressed Steel Car Company.

THE ALLEGHENY STEEL COMPANY, Brackenridge, Pa., is in the market for 10 200,000-lb capacity flat cars.

THE NEW YORK CENTRAL has issued an inquiry for 1,000 36-ft., 40-ton steel underframe and steel-end box cars.

THE ALASKA ENGINEERING COMMISSION, Washington, D. C., will receive bids until March 1 on 10 box cars and 2 caboose cars.

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for 25 second-hand convertible Roger ballast cars.

THE CINCINNATI, NEW ORLEANS & TEXAS PACIFIC has withdrawn its inquiry for 1,000 box cars mentioned in the *Railway Age Gazette* of January 21.

THE NEW YORK, NEW HAVEN & HARTFORD is rumored to have ordered 500 automobile cars from the Standard Steel Car Company. This item has not been confirmed.

THE CHICAGO, MILWAUKEE & ST. PAUL has issued inquiries for prices on 100 steel flat cars, and is building 250 automobile cars in its Milwaukee shops, and 150 logging cars in its Tacoma shops.

MORRIS & Co., reported in the *Railway Age Gazette* of February 11 as contemplating the purchase of refrigerator cars, has issued an inquiry for 150 stock cars, not for refrigerator cars, as mentioned.

THE CHICAGO GREAT WESTERN, reported in the *Railway Age Gazette* of February 4, as being in the market for 200 center constructions, has ordered this material from the Standard Steel Car Company.

THE SOUTHERN PACIFIC has ordered 601 automobile box cars from the Ralston Steel Car Company in addition to the 2310 cars and 275 car bodies which it ordered from that company as reported in the *Railway Age Gazette* of February 18.

PASSENGER CARS

THE ALASKA ENGINEERING COMMISSION, Washington, D. C., will receive bids until March 1 on one office car.

THE ATLANTIC COAST LINE has issued inquiries for 4 baggage, 4 mail and baggage, 2 passenger and baggage cars, and 10 coaches.

THE GREAT NORTHERN is inquiring for prices on 10 65-ft. all-steel baggage and mail cars, and 15 65-ft. single-door all-steel baggage cars.

THE BOSTON & MAINE has ordered the 2 combination baggage and mail cars, for which it was mentioned as inquiring in the *Railway Age Gazette* of December 31, from the Laconia Car Company.

THE INTERNATIONAL & GREAT NORTHERN, reported in the *Railway Age Gazette* of January 21 as being in the market for 5 coaches, 2 dining cars, 2 postal and 2 baggage cars, has ordered 5 coaches, 2 dining cars and 2 postal cars from the American Car & Foundry Company.

THE SOUTHERN PACIFIC, reported in the *Railway Age Gazette* of January 14 as being in the market for 10 baggage cars, 6 postal cars, 6 baggage and mail cars and 15 coaches, has ordered 10 baggage cars, 20 combination baggage and mail cars, 2 combination passenger and baggage cars, and 18 coaches from the Pullman Company.

IRON AND STEEL

THE LONG ISLAND is in the market for 8,000 tons of steel rails.

THE ALASKA ENGINEERING COMMISSION will open bids at Seattle on March 6 for 14,850 tons of open-hearth rails, and for a large amount of track specialties, as noted below.

TRACK SPECIALTIES

THE ALASKA ENGINEERING COMMISSION will open bids at Seattle on March 6 for 14,850 tons of open-hearth rails, 7,000 kegs of track spikes, 1,000 kegs of track bolts, 220,000 nut locks and 50,000 pairs of 24-in. angle splice bars.

SWEDISH RAILWAYS TO BE ELECTRIFIED.—The Stockholm correspondent of the *Morning Post* (London) recently reported that the management of the Swedish State railways contemplates the electrification of the entire system. Experiments concluded last year on the Ofoten Railway, constructed in the early eighties by Englishmen, have given excellent results. Work on this line is expected to be finished in 1924, and the cost is estimated at about \$12,500,000. The power will be taken from the great Porjus waterfalls in Northern Lapland. It is estimated that the import of about half a million tons of coal will be dispensed with as the result of electrification.

EAST INDIAN RAILWAY.—The total operated mileage of the East Indian Railway is 2,447, of which 0.85 miles is six-track, 3½ miles four-track, 24 miles three-track, 611 miles double-track, and 1,808 miles single-track. In addition to these lines, the Delhi, Umballa & Kalka Railway, 191 miles, and the South Behar Railway, 79 miles, are operated by the East Indian Company, making the total length operated at the close of September last year 2,718 miles. Satisfactory progress has been made with the construction of a relief line from Burdwan to Howrah, and it will probably be opened for traffic about the middle of 1916. The East Indian Company has no other new work of importance now in hand.

CHINESE RAILWAYS.—The British consul-general, in an official report for 1914, states that the war has put an end—at least for the time being—to the proposed construction of a railway from Ch'in Chou to Yunnanfu and Chungking. The province is in dire need of railway communication. There was a magnificent harvest throughout the province, much more being produced than was required for the support of the people; but, owing to the lack of transport facilities, the surplus rice could not be moved. The construction of the line from Kichiu to Pishihchai is still under consideration, and at the time of writing (March, 1915) tenders are being invited for the construction of the embankment, and the supply of stone bridges and ballast. A foreign firm has also been approached for the supply of locomotives and trucks.

Supply Trade News

H. C. Brown, Jr., assistant engineer of the Illinois Central at Chicago, Ill., has resigned to become sales engineer of the Chicago Bridge & Iron Works, with office at 37 West Van Buren street, Chicago.

The Haskell & Barker Car Company has purchased about 4,000,000 ft. of fir lumber to be used in the construction of the large car order it recently received from the Southern Pacific. The order was divided between the Hutchins Lumber & Storage Company, the Douglas Fir Sales Company and the Duncan Lumber Company.

P. M. Elliott, general manager of the Camel Company of Chicago, Ill., was recently elected vice-president of that company. Mr. Elliott is a native of Paris, Ill., and the early years of his business career were spent in accounting work. In the fall of 1900 he became sales representative at Chicago for the Monarch Brake Beam Company, of Detroit, Mich., now a part of the Chicago Railway Equipment Company. In the spring of 1902 he entered the employ of the National Railway Specialty Company, now known as the Camel Company, as sales agent. After four years as sales agent and four years as general sales agent, he was made general manager. He held the position of general manager for six years, and was elected vice-president at the annual meeting of the board of directors on January 25.

A. B. Wegener has been appointed general manager of sales of the Camel Company, with headquarters at Chicago, Ill. Mr. Wegener was born at St. Paul, Minn., and as a young man entered the employ of the



A. B. Wegener

New Glasgow, N. S., effective February 15.

the American Bridge Company at Chicago. He remained with this company for 18 years in various capacities, during which time he was stationed at Chicago, Elmira (N. Y.), New York City and Pittsburgh. He was credit manager of the company when he left its service in August, 1912, to become sales agent for the Camel Company, Chicago. His promotion to general manager of sales was effective on January 25.

E. E. Forgeus has been appointed purchasing agent of the Eastern Car Company, Ltd.,

The American Car & Ship Hardware Manufacturing Company, New Castle, Pa., has changed its name to the Johnson Bronze Company. The change in name has been made solely for the convenience of the company's customers; there will be no change in the policy or personnel of the company. The officers of the Johnson Bronze Company are C. H. Johnson, president; T. H. Hartman, secretary and treasurer, and P. J. Flaherty, general manager.

It is announced by the Scherzer Rolling Lift Bridge Company that following the death of Albert H. Scherzer, president, the entire stock of the company has been purchased by a syndicate of officers of the company who have been connected with the business from its inception and that there will be no change in the personnel of the organization, Mr. Scherzer having taken no active part in the affairs of the company for several years. The company has general offices in the Monadnock Block, Chicago, and an eastern office at 220 Broadway, New York, with sales connections in various cities in this country and Europe.

Pennsylvania Steel Company Acquired by Bethlehem Steel Interests

Official announcement was made late February 18 that the Bethlehem Steel Corporation had acquired control of the Pennsylvania Steel Company. The announcement follows:

"C. M. Schwab, chairman, and E. G. Grace, president, of the Bethlehem Steel Corporation, arranged today for the acquisition by the Bethlehem Steel Corporation of the property, business and assets of the Pennsylvania Steel Company.

"The purchase price aggregates approximately \$31,900,000, which is at the rate of par for the preferred shares, and about \$27 per share for the common shares of the Pennsylvania Steel Company. This amount is to be paid in 5 per cent 20-year purchase money bonds of the Bethlehem Steel Company, secured by mortgage upon the purchased property, with the reservation of bonds to retire underlying issues, and to provide for employment and additions.

"This acquisition is the outcome of the determination reached by the Bethlehem Steel Company some time ago to add to its output Bessemer steel products and other general steel lines, such as bridges, frogs and switches, girder rails, rail sittings, etc.

"For a number of reasons it seems that it would be better to accomplish these enlargements by acquiring the plant of the Pennsylvania Steel Company rather than to await the erection of additional plants at Bethlehem. The Pennsylvania Steel Company's plant admirably supplements those at Bethlehem.

"The Sparrows Point plant gives to Bethlehem a plant at the seaboard, which it has long desired for the development of its export trade. The purchase also brings favorable ore properties both in this country and in Cuba, and also important coal deposits."

The Barrett Company

The Barrett Manufacturing Company and the American Coal Products Company, which heretofore has owned the stock of the former company, have decided to unite the good-will and high reputation of both companies under the name of the Barrett Company. The new company will have the same amount of stock as the American Coal Products Company and the change in name will be accomplished by exchanging the outstanding certificates share for share.

The change has been made primarily because the coal tar chemicals, disinfectants, roofing, waterproofing, road-making and wood preserving materials, which have been made and widely advertised in the name of the Barrett Manufacturing Company, have added immensely to the good-will attached to the Barrett name. This increase, however, has not been connected in the minds of the general public with the securities of the American Coal Products Company.

The American Coal Products Company is well known in connection with the sale of sulphate of ammonia.

Some of the widely advertised trade-marks of the Barrett Manufacturing Company are Barrett Specification Roofing, Tarvia, for roads, and Congoleum floor coverings—the latter being manufactured and distributed by the Congoleum Company department of the Barrett Company.

The chemical department of the Barrett Company has produced for many years pure (natural) carbolic acid, cresylic acid, refined naphthalene (in various forms), benzol, toluol, etc., in addition to which it now also manufactures considerable quantities of synthetic carbolic acid (phenol).

TRADE PUBLICATIONS

ENGINES AND PUMPS FOR OIL.—Bulletin No. 9, recently issued by the National Transit Pipe & Machine Company, Oil City, Pa., is devoted to the company's foam system for extinguishing oil fires.

STEEL PIPE.—The American Spiral Pipe Works, Chicago, has issued Bulletin 15-9, descriptive of its line of lap welded pipe. The booklet contains a large number of views of pipe supplied for various installations.

COMPRESSOR APPARATUS.—One of the recent bulletins of the Star Brass Manufacturing Company, Boston, Mass., illustrates and describes the Quincy Market ammonia compressor safety valve manufactured by the company.

CREOSOTED WOOD BLOCK FLOORS.—The Southern Pine Association, New Orleans, La., has issued an eight-page pamphlet reprinting articles which have appeared in the *Railway Age Gazette* and the *Iron Trade Review*, describing the service secured from creosoted wood block floors in shops, freight houses and other buildings. This pamphlet is illustrated with ten photographs of installations.

REFRIGERATION, VENTILATION AND HEATING OF CARS.—The Refrigerator, Heater & Ventilator Car Company of St. Paul, Minn., has issued a 64-page booklet explaining the Moore system of heating, cooling and ventilating cars and pointing out the economies which obtain from its use. It also contains 41 testimonials to the merits of the system received from companies which are using it in their cars.

INDUSTRIAL LOCOMOTIVES.—The Bell Locomotive Works, 30 Church street, New York, in Record No. 7, illustrates and describes its line of industrial steam locomotives burning liquid fuel. These locomotives burn fuel-oil, distillate or gasoline, etc., and have been supplied for use on sugar plantations, in tunnel construction, in industrial plants and mines, on logging railroads, and for similar purposes.

PREPARING METAL SPECIMENS FOR MICROSCOPIC INVESTIGATION.—The metallographic laboratory of the Scientific Materials Company, Pittsburgh, has issued a 16-page pamphlet which describes grinding machines, hack saws, polishing equipment and materials, microscopes and other devices used in the microscopic investigation of metals. It is illustrated and contains information concerning the methods used in preparing specimens for investigation.

PORTABLE ACETYLENE LIGHTS.—The Alexander Milburn Company, Baltimore, Md., has recently issued a 52-page booklet describing and illustrating its line of Milburn lights for all kinds of service. The booklet explains for what service each light is intended, shows typical illustrations, explains the construction, and shows the methods of operating the lights. Several pages are devoted to letters from railways and others, who have used the lights and found them of value.

FOUNDRY EQUIPMENT.—Catalogs No. 118 and No. 119, recently issued by the Whiting Foundry Equipment Company, Harvey, Ill., deal respectively with the Whiting cupola and the company's line of air hoists. In the latter booklet the air hoists are described in detail, views being shown of the several hoists and of typical installations. The catalog describing the Whiting cupola shows sectional and other views, and typical installations of the apparatus in connection with which there is reading matter explaining the features of the cupola's design.

PIPE SPECIALTIES.—The National Tube Company is issuing a very attractive booklet entitled: The Whole "Kewanee" Family. The booklet in its 72 pages illustrates and describes the Kewanee union (the "father" of the family) in its various forms, and the other Kewanee specialties such as the N. T. C. regrinding valves, National service cocks, etc. On page 60 there is a complete list of the Kewanee specialties, and on pages 39 to 47 are given instances of satisfactory uses of Kewanee unions and specialties.

THREADING MACHINERY.—The 1916 catalog of the Landis Machine Company, Inc., Waynesboro, Pa., catalog No. 22, illustrates in its seventy-eight pages, the line of threading machinery made by the company. The booklet contains some exceptionally good photographs of the various kinds of bolt threading, bolt pointing, nut tapping, pipe threading and cutting machines, screw cutting die heads, chaser grinders, etc., and there are also given specifications, list prices, code words, etc., as well as descriptions of the machines and information as to the kind of work for which each is best adapted.

WEIGHING COAL AND WATER IN POWER PLANTS.—Bulletin No. 101 of the Richardson Scale Company, Passaic, N. J., issued under date of January, 1916, bears the title, "Automatic Weighing of Coal and Water in Power Plants." The booklet, which is attractively illustrated and well printed, emphasizes the advantages of weighing coal and water automatically in power plants and aims to show with the aid of halftones and line drawings, the excellencies of the equipment which this company makes for this purpose. The scales are described in detail and a large number of the illustrations show typical installations.

Railway Construction

AUGUSTA & NORTH.—Application will be made soon in Georgia by this company for a charter to operate a line from Augusta, Ga., east to North, S. C., about 60 miles, where a connection is to be made with the Seaboard Air Line. The company plans to use the tracks of the Augusta-Aiken Railway & Electric Corporation from Augusta to Aiken, and to build a new line about 36 miles long from Aiken to North. The incorporators include J. U. Jackson, J. L. Barksdale and W. R. Dawson, North Augusta, S. C.; W. J. Twigg, H. Miller, Augusta, Ga.

AUGUSTA & WESTERN.—A charter has been granted in Georgia to this company with \$100,000 capital, and headquarters at Augusta. The company was organized recently to build a railroad from Augusta, Ga., northwest to Athens, about 95 miles. The incorporators include: W. J. Twigg, P. H. Rice, Augusta; R. W. Lamkin, Athens; C. O. Stevens, Crawford; W. T. Johnson, Washington, and L. E. Blanchard, Harlem. (February 4, p. 227.)

BOSTON SUBWAYS.—Bids are wanted until March 2 by B. Leighton Beal, secretary of the Boston Transit Commission, Boston, Mass., for building section F of the Dorchester tunnel. This section is located in Dorchester avenue and vicinity between Foundry street and West Fourth street, and includes Broadway station, with a loop and inclines for surface cars. The structure is to be mainly of reinforced concrete and structural steel. (Nov. 5, p. 879.)

CHESAPEAKE & CURTIS BAY.—The franchise of this company has been approved by the Maryland Circuit Court, No. 2, Judge Heusler, and it is said that the company is preparing to proceed at once with construction work. The franchise, obtained in regular course, early in 1915, has been disapproved three times by the Maryland Public Service Commission, which body has the power of approval or disapproval of the establishment of new railroads. The disapproval of the commission, on technicalities, is declared by the court, in substance, to be unreasonable. The new company is understood to be backed by important manufacturing interests in the Curtis Bay district. It is a purely industrial road, and will include some industrial tracks which have been in service several years. It is proposed to transfer cars to and from the Pennsylvania and the Western Maryland by floats across the bay. The Baltimore & Ohio already has connections in that district, and was one of the opponents of the new company before the commission. The Public Service Commission will appeal to a higher court.

CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA.—The Wisconsin-Minnesota Light & Power Company is constructing a power dam across the Chippewa river in the vicinity of Chippewa Falls, Wis., which will have the effect of submerging the present location of the so-called "Hannibal" line of the Omaha for a distance of four or five miles between Chippewa Falls and Jim Falls. The power company has arranged to build a cut-off line to take the place of the line which will be submerged, and will let all contracts appertaining to the work, which however, will be under the direct supervision of H. Rettinghouse, chief engineer of the Omaha. The cut-off will be 5.89 miles long, and will involve the movement of about 150,000 cu. yd. of material. A bridge consisting of eight 100-ft. girder spans, and involving the use of 600 tons of steel and 6,000 cu. yd. of concrete masonry, will be built across the Chippewa river. So far as is now known, the track-laying and ballasting will be done by the railroad's forces. H. Rettinghouse, chief engineer.

CHESTER & HOPEWELL.—A contract is reported let to the Vaughan Construction Company, Inc., Roanoke, Va., to build from a connection with the Seaboard Air Line at Chester, Va., east to Hopewell, eight miles. H. D. Eichelberger, president, Richmond.

GEORGIA ROADS (ELECTRIC).—The Federal Construction Company is planning to build an electric interurban line, it is said, from Atlanta, Ga., north to Roswell, thence northeast via Alpharetta to Cumming, thence northwest to Creighton in Cherokee

county, about 55 miles. Napier, Wright & Wood, Atlanta, are the attorneys.

HOT SPRINGS, PINE BLUFF & MISSISSIPPI.—Incorporated in Arkansas with \$3,500,000 capital to build from Hot Springs, Ark., east to Fair in Phillips county, with branches to Pine Bluff and Little Rock, in all about 170 miles. New York, Chicago and Little Rock capitalists are financing the project.

KETTLE VALLEY.—This company will apply to the Canadian Parliament for an extension of time in which to build the following lines: From a point at or near Otter Summit, B. C., to Aspen Grove, not exceeding 30 miles; from a point 50 miles to the north fork of the Kettle river, thence north to Fire Valley, thence northwesterly to Vernon, and then westerly to a connection with the line of the Nicola, Kamloops & Similkameen Coal & Railway Company at or near Quilchena; also from a point on this line near the junction of the east fork and west fork of the north fork of Kettle river north-easterly via Franklin Camp to Killarney; from a point near Hedley on the line to be built from Midway to Hedley north along Twenty Mile creek for a distance of about 20 miles.

LAKE ERIE & NORTHERN (ELECTRIC).—This company opened for business on February 1 the section from Galt, Ont., south to Brantford. The plans call for building an electric line from a connection with the Canadian Pacific at Galt, south via Paris, Brantford, Waterford, and Somcoe to Port Dover on Lake Erie, 53 miles.

MARTINEZ & CONCORD INTERURBAN.—This company was recently incorporated in California with \$200,000 capital, it is said, to build an electric line from Martinez, Cal., southeast to Concord, about seven miles. C. McClellan, San Francisco, and F. E. Peterson, Berkeley, are said to be interested.

NEW YORK, PHILADELPHIA & NORFOLK.—Work is now under way double-tracking the section from Hallwood, Va., to Parksley, 7.4 miles. This work was authorized in October of last year. The company will also double track 5.6 miles between Parksley and Tasley. These improvements when finished will complete the double-tracking of the entire line from Delmar, Del., south to Cape Charles, Va., 95 miles.

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, has awarded the contract for the construction in the borough of Brooklyn of Section No. 2-A of Route No. 12 to the Degnon Contracting Company, the lowest bidder, for \$1,370,098. Contract for the installation of tracks on the White Plains Road extension of the Lenox avenue branch of the existing subway in the borough of the Bronx has been awarded to the Coast & Lakes Contracting Corporation, the lowest bidder, for \$94,280. (February 18, p. 337.)

PITTSBURGH & FT. SCOTT (ELECTRIC).—The L. A. Wells Construction Company, 34 Wade building, Cleveland, Ohio, has the general contract for the construction of 23 miles of electric railroad between Ft. Scott, Kan., and Mulberry, and is ready to receive bids on 250,000 cu. yd. of grading work. It is also in the market for steel rails and connections, ties, poles, trolleys and high tension wires, special work, copper bonds, cars and electrical apparatus for power house and sub-station.

SOUTHERN RAILWAY.—This company recently filed a petition with the Railroad Commission of Georgia asking permission to double track and re-locate its line between Cornelia, Ga., and the South Carolina state line at a point about eight miles beyond Toccoa. This improvement will reduce the distance from 21.93 miles to 18.95 miles. It will also provide easier grades and curves than on the existing line. The work will necessitate the moving of the station sites at Mt. Airy, at Ayersville and at Deercourt.

UNIONTOWN SOUTHERN ELECTRIC.—This company has been granted a right of way, it is said, for a line from Morganfield, Ky., north to Uniontown, 5.2 miles. N. R. Orcutt, engineer, Morganfield.

WAYNE-HARDIN.—Under this name plans are being made to build a railroad from Collinwood, Tenn., west to Savannah, about 35 miles. Wayne and Hardin counties will be asked to vote on a bond issue, and if these counties agree to aid the project, construction work will be started this coming spring. The work will include one steel bridge. The line is projected by

the Tennessee Valley Iron & Railroad Company, Pittsburgh, Pa. This company has already built a line between Iron City and Collinwood. The principal commodities to be carried will be iron ore, lumber and farm products. The incorporators include E. H. Steinman, Collinwood; J. H. De Witt, V. Fuller and J. H. Lechleiter.

WESTERN TERMINAL RAILWAY.—This company was incorporated in Delaware last December with \$10,000,000 capital, and has applied for authority to construct a terminal road at Duluth, Minn., and to cross several streets for a belt line railway system to encircle the city of Duluth. The Corporation Trust Company of America represents the company in Delaware.

RAILWAY STRUCTURES

BICKNELL, IND.—The Vandalia is constructing a 10-track classification yard with additional receiving tracks and an engine house layout, the total cost of which is estimated at \$150,000. The roundhouse layout comprises a small 4-stall roundhouse, a sandhouse, oil house and ash pit, the cost of which will be about \$20,000.

HAMLET, N. C.—The Seaboard Air Line has let contracts to the Vaughan Construction Company, Showsville, Va., for the grading work, and to C. V. York, Raleigh, N. C., for new buildings to be put up in connection with new shop facilities at Hamlet. The work includes a repair yard, lumber yard and storage yard, also new buildings comprising blacksmith and steel car shop, storehouse with platform, air brake office, paint and stencil building, wheel and axle shop, planing mill, lumber shed, wash and locker room. New and modern machinery will be provided in the shops.

JACKSON, TENN.—The Illinois Central has awarded a contract to Joseph E. Nelson & Sons, of Chicago, for the construction of a roundhouse and power house here. The roundhouse will be a brick and concrete structure with timber roof, containing 10 100-ft. stalls. The power house will be a steel-frame brick structure, 37½ ft. by 65 ft. Four outside engine pits, 2 cinder pits and a turntable will also be built. All of the improvements, including incidental trackage, will involve a cost of about \$100,000.

LOUISVILLE, KY.—The Illinois Central is preparing plans for improved shop and yard facilities here.

NEW YORK.—The Pennsylvania Railroad contemplates the erection of a hotel on the site opposite the Pennsylvania station on Seventh avenue and Thirty-second street, New York. It is estimated that the proposed structure will cost between \$4,000,000 and \$5,000,000, and together with the value of the site, the investment will be around \$9,000,000. Nothing definite has been announced as to the dimensions of the building. The architects have not yet finished the plans.

The New York Public Service Commission, First district, is asking for bids, to be opened on March 9, for the completion of construction of station finish, at the Hunters Point avenue station on the Queensboro subway in the borough of Queens.

RALEIGH, N. C.—Improvements are now being carried out to provide additional shop facilities for the Seaboard Air Line at Raleigh, as follows: In the locomotive department a machine shop to have about 3,300 sq. ft. of floor space in connection with a roundhouse, boiler house with trestle, foreman's house, wash-room, shed for fire brick, casting platform, scrap bin, several engine pits, etc., and in the car department a foreman's office and drop pit. New and modern machinery will be provided for both departments, the capacity of the shops is to be much increased and the necessary re-arrangements of tracks to accommodate the above will be made. The A. M. Walkup Company, Richmond, Va., has the contract.

THE ALTAI RAILWAY OF SIBERIA.—On November 3, 1915, the Altai Railroad was opened for passenger traffic. Daily trains with cars of three classes are now running regularly, the cars being new and comfortable. The station buildings are still unfinished, and a dining room has been opened only at Barnaul. At present there is a great shortage of boiled water. The number of passengers is much larger than the builders anticipated. The line cannot carry all the passengers, and many are compelled to wait several days. The traffic from Novo-Nikolaievsk is also very large.

Railway Financial News

CHICAGO, ROCK ISLAND & PACIFIC.—Judge Mayer, in the United States District Court, has signed an order accepting the offer of settlement of \$750,000 made by D. G. Reid, William H. Moore, F. S. Hine, Roberts Walker and E. S. Moore as directors of the Chicago, Rock Island & Pacific Railroad Company (the Iowa company). This is a settlement of claims made by Walter C. Noyes, receiver of the Iowa company, against the former directors for interest. The Iowa company was the company which issued the collateral bonds with Chicago, Rock Island & Pacific Railway Company stock as security, and which bonds were foreclosed and stock distributed to bondholders.

DENVER & RIO GRANDE.—Judge W. C. Van Fleet, in the United States District Court, has permanently enjoined the Equitable Trust Company from proceeding further in a suit outside of Judge Van Fleet's court for a construction of the contract under which the Denver & Rio Grande guarantees interest on the \$50,000,000 first mortgage 5 per cent Western Pacific bonds.

ERIE.—This company has asked the New York Public Service Commission, Second district, for the amendment of previous orders in regard to the issue of \$10,000,000 3-year collateral notes, \$1,000,000 general lien bonds, \$7,000,000 convertible bonds, and \$15,000,000 stock. The Erie has asked permission to issue \$18,000,000 general mortgage 4 per cent 50-year convertible bonds and \$36,000,000 capital stock to provide for the conversion.

INTERNATIONAL & GREAT NORTHERN.—A statement given out by the receivers contains the following:

"It has been the endeavor of the present receivers, as far as it has been possible, to obtain means, to improve the physical condition of the property so that it could be operated more economically. For the first year of their receivership they ballasted practically 130 miles of track, built several new steel, up-to-date bridges; materially improved the drainage of the road-bed everywhere; laid 10 miles of 90-lb. rails, and generally improved the physical condition of the property.

"For the fiscal year ended June 30, 1915, during 11 months of which the road was in the hands of the receivers, the revenue of the road amounted to \$9,083,625, and the operating expenses amounted to \$7,871,449, while the earnings above the expenses amounted to \$1,212,176.

KANSAS CITY, MEXICO & ORIENT.—The Kansas Public Utilities Commission has refused its sanction to the issuance of \$51,941,600 securities under the reorganization plan. The chairman of the commission is quoted as saying that the permission was refused because there was no provision made for retiring bonds outstanding, and that the reorganization plan therefore did not provide a real reduction in proposed capital and indebtedness as compared with the first reorganization plan.

NEW YORK CENTRAL RAILROAD.—This company has sold \$16,000,000 of its own stock, which was until recently held in the treasury of the New York State Realty & Terminal Company, a subsidiary of the New York Central. This stock was issued in exchange for minority stock of the Lake Shore & Michigan Southern. The New York Central has paid off \$15,000,000 of its outstanding notes, which mature November 1. This is in addition to the reduction of about \$100,000,000 in short-term indebtedness, which was made through the sale of \$100,000,000 convertible debentures in May, 1915. The Wall Street Journal says that there is now about \$15,000,000 of notes due in November.

Ouster proceedings have been brought in the circuit court at Chicago against 15 of the directors of the New York Central by certain minority stockholders, the claim being that under the laws of Illinois and Ohio these directors are not eligible because they are also directors of the New York, Chicago & St. Louis.

TEXAS & PACIFIC.—The receivership suit brought against the Texas & Pacific by the Bankers Trust Company of New York has been dismissed by Judge Meek on the ground of lack of jurisdiction.